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AN EVALUATION OF THE CLINICAL TOXICITY OF SULFANILAMIDE AND SULFAPYRIDINE

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The enthusiasm which attended the successful use of sulfanilamide in a remarkably wide range of infections has now been transferred to sulfapyridine. The undoubted ability of this drug to combat pneumococcic infections has naturally led to its widespread adoption in the treatment of pneumonia; but, because it is apparently as potent as sulfanilamide in other types of infection, there is a growing tendency to employ the new in place of the old and proved compound. Before this trend becomes too pronounced it seems timely to inquire into the relative toxicity of the two drugs. This is the more necessary when it is recalled that clinicians have not yet reached agreement as to the blood concentrations of sulfapyridine that are adequate to control pneumonia of pneumococcic origin. Until matters of such fundamental importance are settled, expediency should be tempered by caution.

In the present communication an attempt has been made to evaluate the relative toxicity of sulfanilamide and sulfapyridine in patients under treatment in the hospital. During the past year two different schemes of dosage were employed in the treatment of pneumonia by sulfapyridine. With the first scheme (October 1938-February 1939) the patients were given two doses of 2 Gm. each in the first four hours and were then maintained on 1 Gm. doses every four hours for forty-eight hours, after which they received 0.5 Gm. every four hours until about the seventh day, when chemotherapy was usually terminated. Because the concentrations of sulfapyridine in the blood of these patients were generally deemed to be too low, a new schedule of dosage was instituted in February 1939. This plan called for six doses every twenty-four hours starting with 2 Gm. in each of the first six doses, 1.5 Gm. for the second six doses, 1 Gm. for the third six doses and thereafter 0.5 Gm. in each dose until treatment was concluded. Fluids were also deliberately restricted to less than 2,500 cc. in each twenty-four hours. There were a good many instances in which modifications of both schemes were necessary, but the attempt to follow them provided contrasting data for a study on toxicity. The case fatality rates in pneumococcic pneumonia with the two plans were 5.5 per cent for the earlier and 7.7 per cent for the later, or heavier, schedule.

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BASIS OF COMPARISON OF CLINICAL CASES TREATED BY SULFANILAMIDE AND SULFAPYRIDINE

The following criteria have been observed in selecting cases for a study of the occurrence of toxic reactions:

1. The cases must have been followed by, or been under the supervision of, at least one of us with special attention to the recording of toxic manifestations resulting from chemotherapy.
2. The infections treated must have been of sufficient severity to warrant the employment of either heavy dosage or prolongation of treatment for longer than four days.
3. The protocols must have been as complete as possible with regard to (*a*) daily chemical estimations of the free and total drug in both the blood and the urine, (*b*) daily measurement of the volumes of the fluid intake and urinary output in each twenty-four hours, and (*c*) hemoglobin and white and red cell estimations on at least every second day during treatment, with differential counts when indicated.

With regard to sulfanilamide these criteria were satisfied by only 140 cases out of nearly 300. From the 140 cases the 100 patients receiving the heaviest dosage or showing the most serious toxic manifestations were selected for comparison with the patients receiving sulfapyridine. To this extent the analysis of the cases in which sulfanilamide was given errs on the side of severity. The same general criteria were applied to the patients treated by sulfapyridine, but only the first 100 acceptable cases were selected for analysis: ninety-four of these were cases of pneumonia (eighty being of pneumococcic origin), two were cases of nonpulmonary pneumococcic infections and four were cases of subacute bacterial endocarditis.

THE MILD TOXIC MANIFESTATIONS

In table 1 is shown the comparative analysis of 100 cases treated by each drug. It will be noticed as outstanding that the commonest mild toxic reactions in the sulfanilamide series were cyanosis, headache and dizziness, whereas with sulfapyridine nausea, anorexia and vomiting greatly predominated. Further it will be noted that when the 100 sulfapyridine cases are divided on the basis of the total amount of the drug administered there is a slightly higher incidence of nausea and vomiting in the lighter treated group. This is, no doubt, due to the fact that this group comprises those patients who, for this reason alone, could not or would not continue with the treatment.

There has been a disposition in many of the published reports to gloss over or make light of the incidence of vomiting. We have been much impressed by the great

discomfort, amounting even to agony, which is induced by this complication. It may be too much to say that the frequency with which the body is impelled to resist the retention of sulfapyridine should at once raise the question of its essentially toxic character, but the protest must at least be significant. As an earnest of our convictions on this point, but also as an aid to treatment, many adjuvants and vitamin preparations have been tried without success. Since the use of nicotinic acid for patients treated by sulfanilamide has frequently resulted in a partial alleviation of the more troublesome mild toxic reactions such as depression, headache, nausea, anorexia, dizziness and cyanosis, this vitamin was also used with sulfapyridine. By administering 50 mg. of nicotinic acid by mouth with each dose of sulfapyridine we were able to decrease the frequency of vomiting and sometimes to abolish it. Although this substance is still under trial we have been able in the last three months to demonstrate that either with or sometimes without the concomitant use of nicotinic acid much more satisfactory results have been obtained from the employment of mucilage of tragacanth as an adjuvant.[1] By giving a suspension of from 0.5 to 1 Gm. of powdered sulfapyridine (tablets) in 1 drachm (4 Gm.) of one half British Pharmacopeia strength of mucilage of tragacanth we have been able frequently to treat patients who previously have been adamant in their refusal to take the drug. The blood concentrations resulting from this procedure of dosing have not been lowered; on the contrary, because vomiting is much reduced they have generally been higher. The single disadvantage of the method arises from the rapidity with which the tragacanth becomes sour and distasteful, requiring the mixture to be freshly made every twenty-four hours.

Table 1.—*Analysis of Cases in Which Dose Was Received by Mouth: Mild Toxic Manifestations*

	Sulfanilamide, All Cases	Sulfapyridine		
		All Cases	Less Than 25 Gm. Received	More Than 25 Gm. Received
Number of cases	100	100	40	60
Average values				
Age	38	41.7	43.4	40.5
Total dosage, Gm.	37	34.3	15	42.2
Duration of chemotherapy, days	7.4	6.7	3.75	8.7
Daily dosage, Gm.	5	5.1	4.9	4.8
Maximum concentration of total drug in blood, mg. per 100 cc.	9.8	10.6	9.5	11.3
Maximum concentration of free drug in blood, mg. per 100 cc.	6.7	8.7	7.3	9.6
Nausea and anorexia	6	88	35 (87.5%)	45 (75%)
Vomiting	2	68	28 (70%)	40 (66%)
Dizziness	16	4	2	2
Headache	20	4	3	1
Cyanosis	84	10	3	7
Depression	5	7	2	5
Somnolence	3	4	2	2
Ringing in ears	14	5	2	3
Diarrhea	3	1	1	0

The blood of sixteen patients on sulfanilamide and of two patients on sulfapyridine showed a dark line easily observed between 610 and 630 millimicrons (from one to three dilutions of the washed red blood corpuscles in distilled water were placed in a 5 mm. cell and viewed through a spectroscope having a 38 by 22.5 mm. prism face). In only two cases (in both of which treatment was interrupted for this cause) did cyanosis remain for as long as seventy-two hours after the drug was withdrawn. It is assumed that methemoglobinemia was contributory to the cyanosis in all the eighteen cases; but the rapidity with which the condition cleared makes it unlikely that sulfhemoglobinemia was present to any important degree.

THE SEVERE TOXIC MANIFESTATIONS OF SULFANILAMIDE AND SULFAPYRIDINE AS ANALYZED ON THE BASIS OF ORAL DOSAGE

The data with respect to serious toxic reactions resulting from chemotherapy by both drugs are set forth in table 2, which also contains subanalyses of the sulfapyridine series. While it cannot be claimed that all of the side effects listed in this table are of equal importance, yet they frequently occurred together in the same patients and in several instances heralded other grave toxic reactions. For this reason it is perhaps justifiable to point out that, excluding drug rashes and fevers, the number of such manifestations in 100 sulfanilamide cases totals nineteen as against sixty-three in the 100 sulfapyridine cases. If the drug rashes and fevers are included—and these are generally accepted as indications for interrupting or terminating chemotherapy—the totals are respectively forty against seventy-eight.

The occurrence of renal complications, which is discussed more fully elsewhere in this paper, was practically confined to the sulfapyridine series, in which pain in the loins, oliguria, anuria or hematuria was noted in thirty instances. The single patient in the sulfanilamide series who exhibited three of these complications had pyelonephritis and the retained drug reached a very high concentration in the blood (31 mg. per hundred cubic centimeters).

Leukopenia and neutropenia were more common in the patients on sulfapyridine. Not a single case of granulocytopenia had occurred among nearly 300 patients treated by sulfanilamide, whereas there were three cases among the first hundred patients receiving sulfapyridine. On the other hand, although slowly progressive or sudden anemia occurred with about equal frequency in the two series under review, the cases of true acute hemolytic anemia were confined to the patients on sulfanilamide.

When the 100 sulfapyridine cases are subdivided into those in which light dosage was received (forty cases in group 1) and those in which heavy doses were given (sixty cases in group 2) the seventy-eight serious toxic manifestations of the entire series are found 4.5 times as frequently in the group treated by heavy doses. It is particularly to be noted that almost all the cases exhibiting renal complications fall into group 2. Drug rashes and fevers and blood dyscrasias also occurred more frequently in this group.

When the sixty cases in group 2 in which more than 25 Gm. of the drug in all was received are further subdivided into those (forty-five cases in group 2 A) in which sulfapyridine was received for less than ten days and those (fifteen cases in group 2 B) in which it was received for more than ten days, certain important facts are revealed. By eliminating the patients (of group 2 B) on prolonged dosage the average total dose of the remainder (group 2 A) becomes 38.4 Gm. and the

1. Detweiler, H. K.; Kinsey, H. I.; Brown, W. H., and Feasby, W.: The Treatment of Pneumonia with Sulfapyridine (Dagenan): Observations on Toxic Reactions, Arch. Int. Med., to be published.

average daily dose rises to 6.5 Gm., since the average duration of treatment is 5.9 days. This group therefore comprises the patients on heavy dosage who were treated for about six days and may be reasonably compared with the forty patients in group 1 who were receiving smaller doses over a shorter average period. The comparison reveals that forty-nine examples of severe toxicity were encountered in group 2 A as against fourteen in group 1. It is also highly significant that almost all the severe urinary complications fall into group 2 A. In the single case in group 2 B and the four instances in group 1 these complications were detected in the early days of treatment while the patients were receiving intensive therapy.

Group 2 B, containing the fifteen cases in which dosage was prolonged (average duration of treatment seventeen days) is noteworthy for the very large total amounts of the drug administered (average over 65 Gm.). The blood concentrations in these patients were lower than in any other group and were less, on the average, than the maximum values given in table 2, being maintained for by far the greater time at about 5 to 7 mg. per hundred cubic centimeters for the total and from 3 to 5 mg. for the free drug. This group comprises cases of empyemas or of delayed resolution (eleven cases) and subacute bacterial endocarditis (four cases).

The salient feature of this small category is that all three cases in which granulocytopenia developed fall within it.[1a] Two of these patients died; one, concerning whom the details have already been published,[2] received 85 Gm. of sulfapyridine over seventeen days. Death was preceded twelve days by anuria during intensive dosage. The other two patients had subacute bacterial endocarditis and at no time received intensive chemotherapy. The average blood levels were about 7 mg. of the total drug and about 4.5 mg. of the free form per hundred cubic centimeters. Full descriptions of these two cases will later be published but it is necessary to the argument to state that for the patient who succumbed (a man of 30), the total dosage was 39 Gm. given over twenty days and for the patient who spontaneously recovered 37 Gm. in fifteen days.

It may be pertinent to record that, in all three of the cases in which granulocytopenia developed, chemotherapy had been interrupted for from three to six days for some reason of toxicity. In one it was due to anuria and a drug fever and in the other two to intractable vomiting, which was overcome by the use of adjuvants as previously noted. All three, as is indicated in table 2, exhibited leukopenia before becoming entirely agranulocytic, but in only one case did this occur more than twenty-four hours before the drug was stopped.

ANALYSIS OF THE TOXIC MANIFESTATIONS RESULTING FROM THE ADMINISTRATION OF SULFAPYRIDINE BASED ON AVERAGE MAXIMUM BLOOD CONCENTRATIONS

The only valid basis on which the toxicity of a relatively insoluble and variably absorbed drug can be estimated must be the levels attained in the blood. There are, however, obstacles to precision and clarity even here. The 100 patients on sulfapyridine were followed daily, with very few exceptions, when occasional days were missed, by chemical assays of the blood for both the free and the total drug. However, it is almost impossible to provide an intelligible analysis of this considerable amount of data. What was done, therefore, was to take the average maximum concentrations of the total and the free sulfapyridine in the blood which were operative over twenty-four hours of the first ninety-six hours of treatment. They are the averages of the highest concentrations attained rather than the average levels maintained throughout treatment. By and large these maximums reflect the absorbability of the drug in terms of dosage, but they also include examples of accumulation of the drug when this occurred in the first four days of treatment.

TABLE 2.—*Analysis of Cases in Which Dose Was Received by Mouth: Severe Toxic Manifestations*

		Sulfapyridine				
			Subanalysis of 100 Cases		Subanalysis of 69 Cases: More Than 25 Gm. Received	
			Group 1: Less Than 25 Gm. Received	Group 2: More Than 25 Gm. Received	Group 2A: For Less Than 10 Days	Group 2B: For More Than 10 Days
	Sulfanilamide, Entire Series	Entire Series				
Number of cases	100	100	40	60	45	15
Average values						
Age	38	41.7	43.4	40.5	40	42.4
Total dosage, Gm.	37	54.5	18	82.2	58.4	65.6
Duration of chemotherapy, days	7.4	6.7	3.75	8.7	5.9	17
Daily dosage, Gm.	5	5.1	4.9	4.8	6.5	3.9
Maximum concentration of total drug in blood, mg. per 100 cc.	9.8	10.6	9.5	11.3	12.2	8.9
Maximum concentration of free drug in blood, mg. per 100 cc.	6.7	8.7	7.3	9.6	10.5	7
Delirium	2	7	2	5	5	0
Nervous twitching	0	3	0	3	3	0
Peripheral neuritis	1	1	0	1	0	1
Pain in loins	1*	4	0	4	3	1
Oliguria (less than 400 cc. in 24 hours)	1*	16	2	14	13	1
Anuria	0	4	0	4	3	1
Hematuria (microscopic)	1*	6	2	4	4	0
Leukopenia (less than 4,000 per cu. mm.)	3	10	3	7	4	3
Granulocytopenia	0	3	0	3	0	3
Mild anemia (of gradual onset)	5	6	1	5	4	1
Subacute anemia	2	3	1	2	1	1
Acute hemolytic anemia	3	0	0	0	0	0
Drug rash	7	7	1	6	4	2
Drug fever	14	8	2	6	5	1
Totals	40	78	14	64	49	15

* Occurring in the same patient.

In table 3 the 100 cases of the sulfapyridine series are divided into categories based on the average maximum blood concentrations regardless of dosage or duration of treatment. It will be seen that nausea and vomiting have about the same incidence in all groups. The fact that they occur less frequently in the group with the highest concentrations may in itself be a partial explanation for the levels attained. It might be argued that this observation lends some support to the view that vomiting is a local phenomenon, especially since tragacanth has been useful in overcoming this complication. On the other hand every patient who has been treated by us by injection alone has suffered from nausea and the majority have vomited, and this strongly suggests that there is also a central causation.

1a. In all three cases the polymorphonuclear cells entirely disappeared from the blood.

2. Morgan, J. R. E., and Detweiler, H. K.: The Haematological Study of Seventy-Six Pneumonia Cases Treated with Sulfapyridine, Including a Fatal Case of Agranulocytosis, J. Lab. & Clin. Med. 25:275 (Dec.) 1939.

The analysis in table 3 is self explanatory but attention is drawn to group C, which includes the toxic manifestations occurring in all patients (groups A and B) having higher blood concentrations of the total drug than 10 mg. per hundred cubic centimeters and of the free than 8 mg. The significant facts again emerge that oliguria and anuria are found in the cases exhibiting high concentrations in the blood and that the serious toxic reactions occur comparatively seldom in the cases which do not attain these high levels. It requires, however, to be emphasized that leukopenia, anemia, rashes and fevers may occur in any group and that neither low dosage nor low concentrations should be regarded as a license to relax the precautions necessary to guard against these complications. It has been our custom to stop chemotherapy as soon as rashes or drug fevers are detected, and for this reason we are unable to substantiate the claim of others [3] that these are frequently the precursors of other dangerous manifestations of toxicity. It is nevertheless important to recognize that anemia, leukopenia, granulocytopenia and urinary dysfunction may occur without any warning in the form of either drug rashes or fevers.

TABLE 3.—*Relation of the Concentration of Sulfapyridine in the Blood to the Commoner or More Severe Toxic Manifestations*

	Subgroups				
	A	B	(A + B) = C	D	Entire Series
Average maximum concentrations of sulfapyridine in the blood in mg. per 100 cc. Total	>12	10.12	>10	<10	10.6
Average maximum concentrations of sulfapyridine in the blood in mg. per 100 cc. Free	>10	8-10	> 8	< 8	8.7
Number of cases	30	25	55	45	100
Nausea and anorexia	23 (77%)	20 (80%)	43 (78%)	37 (82%)	80
Vomiting	19 (63%)	17 (68%)	36 (66%)	32 (71%)	68
Cyanosis	4	4	8 (15%)	2	10
Delirium	2	3	5	2	7
Nervous twitching	3	0	3	0	3
Pain in loins	2	1	3	1	4
Oliguria	9 (30%)	5 (20%)	14 (26%)	2 (4.5%)	16
Anuria	4	0	4	0	4
Hematuria (macroscopic)	3	2	5	1	6
Leukopenia (< 4,000 per cu. mm.)	6 (20%)	2	8 (15%)	2	10
Granulocytopenia	1*	0	0	2 + 1*	3
Mild anemia (of gradual onset)	2	2	4 (7%)	1	5
Subacute anemia	0	3	3	1	4
Drug rash	3	3	6 (11%)	1	7
Drug fever	4 (13%)	2	6 (11%)	2	8

* In all cases of granulocytopenia more than 27 Gm. was received over a period longer than fifteen days. The asterisk denotes the same patient. See text.

THE RELATIONSHIP OF THE CONJUGATED FORM OF SULFAPYRIDINE TO TOXICITY

It has been stressed in a recent report [4] that the occurrence of high values for the acetylated or conjugated form of sulfapyridine in the blood is particularly associated with partial or complete renal failure. An increase in the conjugated moiety is a natural result of such failure since, if the liver function is not disturbed, acetylation will continue at the expense of the accumulated free form. Several examples of this have been encountered and commented on; [4] but it has also been noted that apart from renal failure there is a considerable variation in the rate at which acetylation proceeds in different cases. Acetylation is generally considered to be an attempt on the part of the liver to detoxicate poisonous substances, and it would be reasonable to expect that the conjugated form of sulfapyridine would prove to be a good deal less toxic than the free form.

Marshall's statement [5] that conjugated sulfapyridine is actually more toxic to animals than is the free form raises a point which requires confirmation. In this series it has been noticed that irrationality and delirium, nervous twitching, hematuria, pain in the loins, oliguria and anuria have most frequently been found in association with demonstrably high concentrations of the conjugated fraction. Rashes, fevers, leukopenia and one case of granulocytopenia have also been observed following earlier high blood concentrations of the acetylated form, although it must be said that the majority of the latter complications occurred in the absence of such evidence.

We have been impressed by the coincidence of these occurrences but it is impossible to state that they provide convincing proof of the contention that the conjugated form is more toxic than the free drug. In all instances in which the severe toxic reactions were found in association with a high level of the conjugated forms, the concentrations of the free drug was also high or renal failure was present. The concentration of the total drug was, of course, very high; and, while this fact does not necessarily support the thesis that acetylation actually increased the poisonous properties of sulfapyridine, it certainly does not suggest that the attempt at detoxication had been very successful.

In the human subject with normal renal function the conjugated form of sulfapyridine is apparently excreted more rapidly than the free drug.[4] Marshall's observation [5] might justify speculation as to whether the failure to "detoxicate" sulfapyridine in the process of acetylation is compensated by an increased excretion of the conjugated form. It is our opinion that the facts are susceptible of a different interpretation. While remarking on the great insolubility of the conjugated form of sulfapyridine and its proclivity for impairing renal function, Marshall [5] did not clearly differentiate between the essentially poisonous potentialities of acetylsulfapyridine and the complications due to its physical properties. Seven of eight dogs used in his experiment died within forty-eight hours of receiving sodium acetylsulfapyridine intravenously. All showed crystalline deposits in the collecting tubules and stones in the urinary tract at necropsy. The eighth dog was anuric for forty-eight hours and died on the eighteenth day. These results suggest that obstruction brought about by the precipitatation of crystals of acetylsulfapyridine into the tubules caused renal failure and that death resulted from this rather than from actual tissue damage due to toxicity.

Of the four patients who had acute anuria in the presently reported series, only one died in this state (case 2 [4]). At autopsy crystals were found in the collecting tubules, in which there was also considerable toxic damage to the lining renal epithelium. The blood concentrations at death were very high for free sulfa-

3. Long, P. H., and Bliss, Eleanor A.: The Clinical and Experimental Use of Sulfanilamide, Sulfapyridine and Allied Compounds, New York, Macmillan Company, 1939.

4. Brown, W. H.; Thornton, W. B., and Wilson, J. S.: Observations on the Absorption, Distribution and Excretion of Sulfapyridine, Dagenan or M. & B. 693, J. Clin. Investigation 18: 803 (Nov.) 1939.

5. Marshall, E. K., Jr., and Litchfield, J. T., Jr.: Some Aspects of the Pharmacology of Sulfapyridine, J. Pharmacol. & Exper. Therap. 67: 454 (Dec.) 1939.

pyridine (17 mg. per hundred cubic centimeters) but only 3.8 mg. per hundred cubic centimeters was in the conjugated form. In the three cases in which recovery occurred from the anuric state a very rapid accumulation of the conjungated moiety preceded and accompanied the cessation of renal function.[6] The suggestion is therefore made that the animal experiments and our clinical observations are complementary and constitute strong evidence that renal complications due to sulfapyridine

Fig. 1.—A wire yoke carries three nests of capsules. The small, innermost capsule, *X*, contains 65 mg. of free, or pure, sulfapyridine. Capsule *O* is empty, and capsule *Y* contains 65 mg. of acetylsulfapyridine crystals as recovered from the urine of a patient on sulfapyridine therapy. In both instances the capsules were placed in a folder and roentgenographed from 24 inches with a 20 milliampere current. *A* was exposed for three seconds with 20 kilovolts and *B* for one and one-half seconds with 40 kilovolts. No cassette or Bucky grid was used.

therapy have their origin in the great insolubility of acetylsulfapyridine rather than in an increased toxicity of this "detoxicated" form of the drug. For this reason we continue to urge that when the output of urine of patients receiving sulfapyridine falls below 1,000 cc. in twenty-four hours the concentrations of both the free and the total sulfapyridine in the blood should be ascertained and the fluid intake at once increased in an attempt to prevent supersaturation of the urine. When severe oliguria or anuria occurs it has been our practice to administer hypertonic dextrose solutions by the continuous intravenous drip method. From 300 to 400 cc. of 20 to 25 per cent dextrose given over a period of two to four hours has on three occasions been rapidly successful in restoring renal function.

CRYSTAL AND CALCULUS FORMATION IN PATIENTS RECEIVING SULFAPYRIDINE

Recognition that oliguria, anuria and hematuria occurring during treatment by sulfapyridine are probably related to the formation of crystals in the urinary tract has led to the current use of the term "renal irritation" to denote these complications. The statement of Long and Wood [6] that crystalline deposits are found in the urine of practically all individuals who receive sulfapyridine is in accord with our own experience. There is a distinct relationship between the rate at which acetylation proceeds and the amount of crystals deposited in the urine. The urines of patients who conjugate the drug rapidly, and who therefore excrete acetylsulfapyridine in high concentrations, invariably contain very large amounts of crystals. The reverse is also true. The only patients who, while receiving substantial amounts of sulfapyridine, show few or no crystals in the urine are demonstrably those who conjugate the drug slowly and excrete little of the acetylated form in the urine.

The crystals are usually colorless and appear as flat, thin plates with a sharply pointed elliptic outline. They are precipitated from both acid and alkaline urines, and changes in reaction do not alter their physical characteristics. If urine containing crystals is first thoroughly mixed and analyzed and then after centrifuging is subjected to fractional analysis, it is found that the supernatant fluid of the second analysis contains from 95 to 99.5 per cent of all the free drug found in the mixed specimen. The crystalline deposit on the other hand is almost entirely made up of acetylsulfapyridine. If the crystals are washed with water, dried and repeatedly recrystallized from one sixth normal acetic acid the melting point becomes constant at about 225 C., which closely corresponds with the melting point of pure acetylsulfapyridine. There can be no doubt that the crystals commonly found in such patients consist almost entirely of acetylsulfapyridine. We have not been able to alter the rate or degree of precipitation by giving alkalis by mouth; urines of p_H 9 exhibit large amounts of the crystals of acetylsulfapyridine in the same field with the crystals of triple phosphates.

The crystals of both free and acetylated sulfapyridine are slightly opaque to x-rays. Small gelatin capsules (Parke, Davis & Co., No. 5) 1 cm. long and 4.5 mm. in diameter containing 65 mg. of either form of the drug are easily seen in x-ray films exposed for three seconds to 40 kilovolts (fig. 1). When, however, the same capsules are placed in the pelves of the kidneys

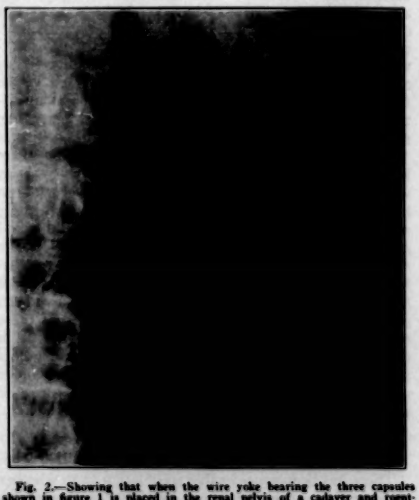

Fig. 2.—Showing that when the wire yoke bearing the three capsules shown in figure 1 is placed in the renal pelvis of a cadaver and roentgenographed by kidney, ureter and bladder (K. U. B.) flat plate technic (55 kilovolts, 23 milliampere current for three seconds) using cassette and Bucky grid, no sign of the capsules or their contents is seen. The same result was obtained with 48 kilovolts. The capsules were afterward recovered intact from the cadaver.

or the bladder of a cadaver and roentgenographed with kidney, ureter and bladder (K. U. B) technic, no trace of the capsules can be observed (fig. 2). This clearly demonstrates that small calculi consisting only of sulfapyridine or acetylsulfapyridine cannot be detected in the urinary tract by routine kidney, ureter and bladder x-ray technic.

6. Long, P. H., and Wood, W. B., Jr.: Observations upon the Experimental and Clinical Use of Sulfapyridine: II. The Treatment of Pneumococcal Pneumonia with Sulfapyridine, Ann. Int. Med. 13: 487 (Sept.) 1939.

Owing to the greater solubility of both the free and acetylated forms of sulfanilamide, crystals are very seldom found in the urine of patients receiving it. Very occasionally long needle-like crystals, easily mistaken for tyrosine, are found in the urine. These on analysis have been shown to consist almost entirely of acetylsulfanilamide.

In view of the observations on the patients treated by sulfapyridine a follow-up investigation was instituted. At the time of writing, fifty-two of the 100 patients at present under review have been examined, between six and twelve months after discharge from the hospital. Only two of these have complained of symptoms suggesting mild renal colic, and in both of these a distinct narrowing of the right ureter near the pelvic brim was demonstrated by x-rays using a contrast medium (diodrast). No calculi were visible. Both patients have refused cystoscopy. Neither had shown evidence of renal irritation during the actual period of chemotherapy. Of the remaining fifty patients, none complained of symptoms referable to the urinary tract. The fifty-two patients constituted a representative series: Thirty-eight fell into the group on heavy dosage and thirty-one into the group who under treatment exhibited total concentrations of sulfapyridine in the blood that were higher than 10 mg. per hundred cubic centimeters (table 3, subgroup C). Eight patients had oliguria and one became anuric while receiving sulfapyridine. Two had had gross hematuria. The patients were first investigated by kidney, ureter and bladder x-ray study and twenty-one were noted to have shadows suggestive of calculi in the urinary tract. When these patients were reexamined with use of intravenous diodrast, no abnormalities or calculi in the urinary tract were detected in the x-ray films, with the two exceptions already noted. Contrast mediums were also employed in the examination of nine other patients with completely negative results.

The importance of these largely negative observations lies in the general characteristics of the series as a whole. Most of the patients investigated had been heavily treated with sulfapyridine while on deliberately restricted fluid intake. This resulted in very high blood concentrations of sulfapyridine and an unusually large number of urinary complications. It must be remembered, however, that retrograde pyelograms have not been done and that only thirty patients in all have been studied by intravenous contrast mediums, and of these two have some narrowing of undetermined origin in the right ureter. Of the remaining twenty-two patients who were investigated by kidney, ureter and bladder technic it may only be said that they are symptom free and have no radiopaque calculi in the urinary tract.[6a]

HEPATITIS AS A SIDE EFFECT OF SULFAPYRIDINE THERAPY

There has been considerable speculation as to whether sulfapyridine causes hepatitis. We have on three occasions successfully employed sulfapyridine to control pneumonia in patients who also had severe hepatitis without observing that the liver dysfunction was increased. On the other hand the occurrence of hepatitis after chemotherapy has been instituted has usually been considered to be an indication for withdrawing the drug, although it has not yet been established whether this precaution is necessary.

6a. Dr. W. C. Kruger and Dr. T. W. Dean of the Department of Radiology, Toronto Western Hospital, made the roentgenologic studies here reported.

In a previous report [4] it was stated that in the surviving patients who were treated by oral administration alone, the last measurable quantity of sulfapyridine disappeared from the blood in sixty hours and from the urine, excepting faint traces, in ninety-six hours after the final dose had been given. This statement still stands, with allowable latitude in the definition of the word "measurable"; but it requires some qualification. In the report in question a protocol was included of a patient (case 4) who received sulfapyridine intramuscularly as a 33 per cent solution of the sodium salt as well as sulfapyridine by mouth; and a curious phenomenon was noticed: although the blood was reported to be free from sulfapyridine 120 hours after the last dose had been given by mouth, measurable (and variable) quantities were recovered in the urine for 136 hours and traces appeared for a further thirteen days. These data were considered unusual and were attributed to the fact that intramuscular injections had been employed. Hepatitis followed the cessation of chemotherapy, but it was thought that no valid conclusion could be drawn as to any interrelation between the prolonged excretion of the drug and liver damage. Since that time two patients have died, one ten days and the other forty days after receiving the last dose of sulfapyridine. Neither showed any evidence of hepatic damage in life or in death. In the first case at necropsy 45 mg. of sulfapyridine was found in the liver. In the second case the blood had been reported as negative for sulfapyridine on the sixth day after the final dose had been given but traces were present in the urine until the thirty-first day and at death traces were still recoverable from the liver. These facts have no great importance from a quantitative point of view in regard to excretion, but they indicate that minute quantities of sulfapyridine may be excreted by patients who had neither intramuscular injections nor hepatitis for much longer than we had formerly thought. They also indicate that sulfapyridine remains in the liver for a very long time, and this fact should be borne in mind before the drug is completely exonerated as a cause of liver damage.

COMMENT

The evidence which has already been discussed strongly suggests that sulfapyridine is essentially more toxic than sulfanilamide. The more frequent occurrence of leukopenia and granulocytopenia is indicative of this. On the other hand, dogmatic pronouncements are out of place when conclusions are drawn from a small series of cases, and great care must be taken to sift the evidence on which such conclusions rest. It is, in the first place, pertinent to recall that a large number of the serious toxic reactions encountered in the sulfapyridine series were urinary complications. In all probability these owe their origin to the formation of crystals of the highly insoluble acetylsulfapyridine (as discussed in the present paper and by Long and Wood [6]), and it is considered likely [4] that the serious renal disturbances may be largely avoided by maintaining the fluid intake at a figure (from 3,000 to 3,500 cc. in twenty-four hours) which should insure a urinary output of not less than 1,000 cc. in twenty-four hours. The urinary complications constitute a very undesirable and serious drawback to sulfapyridine therapy on both clinical and toxicologic grounds, but they may be considered to be more related to the physical characteristics of the drug than to its purely toxic properties. Unfortunately, in practice these niceties of distinction

become academic since urinary dysfunction leads to an accumulation of sulfapyridine [4] in the body and thus increases its noxious potentialities.

Most of the serious toxic reactions of sulfapyridine occurred in patients on a schedule of dosage which produced an accumulation of the drug in the blood, especially when the fluid intake was reduced. Since it is not known that such high concentrations as were attained are necessary to control pneumococcic infections, and since very few of the serious toxic manifestations of sulfapyridine were encountered in the first forty-eight hours of treatment, we consider the scheme of dosage advocated by Long and Bliss [5] and Long and Wood [6] to be superior to either of the methods here described. In other words, the maximum blood concentrations should be reached at the very beginning of treatment and should be allowed to fall after a short period of maintenance.

We believe, however, it has been shown that high blood concentrations of sulfapyridine may be dangerous and that they should be avoided unless it is certain that lower concentrations are not controlling the infection. It is on the latter aspect of treatment that authoritative pronouncements are most urgently required, and the facts can be ascertained only by expectant undertreatment. The range between adequate blood concentrations and those which carry an unwarrantable risk of serious toxicity has been shown to be so narrow as to provide justification for a more conservative approach to the chemical treatment of pneumonia and to constitute a valid argument against the indiscriminate substitution of sulfapyridine for sulfanilamide in nonpneumococcic infections.

CONCLUSIONS

1. The vomiting caused by the administration of sulfapyridine appears to be of both local and central origin. Mucilage of tragacanth and nicotinic acid are of value in combating the vomiting and other mild toxic reactions.

2. Although methemoglobinemia contributes to cyanosis in a small number of cases, sulfhemoglobinemia has not been encountered.

3. The serious toxic manifestations have been found twice as frequently in the series treated by sulfapyridine as compared with the series on sulfanilamide.

4. Oliguria, hematuria, pain in the costovertebral angle and anuria are serious and fairly common complications of intensive sulfapyridine therapy, particularly when the concentrations in the blood are high. These sequelae are related to the insolubility of acetylsulfapyridine, which precipitates in characteristic crystals in acid and alkaline urines. For this reason the fluid intake should approximate 3,000 cc. or more in twenty-four hours, and the urine volume in a like period should not be allowed to fall under 1,000 cc.

5. Although leukopenia occurs more frequently in the sulfapyridine series and especially when the dosage is heavy, it is also encountered in both series and may occur when the doses are small or treatment is of short duration.

6. Acute hemolytic anemia with icterus was encountered only in the cases in which sulfanilamide was administered. Both series comprised instances of gradual and suddenly developing anemia.

7. Three cases of granulocytopenia were encountered in the 100 cases in which sulfapyridine was given. All three occurred in cases in which treatment was maintained for longer than fifteen days at low blood concentrations.

8. Patients treated with intensive doses and in whom high blood concentrations of sulfapyridine were attained showed a very high incidence of serious toxic reactions.

9. Drug rashes and fevers are useful signs of toxicity, but serious toxic complications may occur without these warnings.

10. Sulfapyridine may remain in the liver in small quantities for as long as forty days after chemotherapy has been terminated. No conclusion has been reached as to whether sulfapyridine causes hepatitis.

11. Sulfapyridine is essentially more toxic than sulfanilamide.

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HODGKIN'S DISEASE

AN ANALYSIS OF 212 CASES

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This study, consisting of an analysis of 212 histologically proved cases of Hodgkin's disease, is made in the hope of contributing further data to this important subject.

Of these cases, 126 were followed by the Radiation Therapy Department of Bellevue Hospital and eighty-six at the New York City Cancer Institute during the eleven years 1926-1936 inclusive. Fifty-four additional cases clinically diagnosed as Hodgkin's disease were omitted because histologic examination was not made. Of the cases studied, 123 remained under observation until death occurred. Autopsy was performed on thirty-four, or 28 per cent.

AGE AND SEX INCIDENCE

That Hodgkin's disease may occur at any age is demonstrated in this series, in which the youngest patient was 6 and the oldest 76. A study of the age distribution reveals the greatest number of cases occurring in the third decade.

The youngest patient recorded in the literature is that of Priesel and Winkelbauer,[1] a girl 4½ months old who died of this disease, which had been present since birth. A cervical node removed from the mother in the last month of pregnancy showed Hodgkin's disease.

In the series reported here 143 (67.5 per cent) were males and sixty-nine (32.5 per cent) females. This is in agreement with the data of Wallhauser,[2] who in a compilation representing twenty-one publications listed 1,009 males and 438 females, a ratio of 2.3 to 1.

It is noteworthy that, of the eighteen children under 15 years of age in our series, sixteen were boys. Of patients over 15 years of age with Hodgkin's disease, the percentages were 65 for males and 35 for females.

RACE AND NATIONALITY

Races and nationalities are often respected by various diseases. However, Hodgkin's disease attacks, without exception, members of every race. In this series the occurrence in Jews, Italians and Negroes was noted as forty-four (20.7 per cent), forty-one (19.3 per cent) and fourteen cases (6.6 per cent) respectively. In the year 1936, 21.1 per cent Hebrews, 5.6 per cent Italians

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1. Priesel, A., and Winkelbauer, A.: Virchows Arch. f. path. Anat. 262: 749, 1926.

2. Wallhauser, Andrew: Hodgkin's Disease, Arch. Path. 16: 522 (Oct.), 672 (Nov.) 1933.

and 4.2 per cent Negroes were admitted to the Radiation Therapy Department of Bellevue Hospital. Peirce, Jacox and Hildreth [3] at Michigan, in a study of 214 cases, found a racial distribution predominantly white and American born. Among their patients there were three Jews and one Negro. A few of their patients were of European origin.

ETIOLOGY—PREDISPOSING FACTORS

As far as could be determined there were no demonstrable predisposing factors in any of the cases studied. Environment, occupation, food and previous disease were not outstanding factors, and in no instance was there a familial history of Hodgkin's disease. McHeffey and Peterson [4] have recently reported two cases of Hodgkin's disease occurring almost simultaneously in two brothers, aged 11 and 13 years.

Table 1.—*Age Distribution*

Decade of life	1	2	3	4	5	6	7	8
Number of cases	11	25	62	46	24	25	15	4

In only fifteen cases (7 per cent) was there a family history of tuberculosis. In spite of constant decline in the incidence of tuberculosis, it is the general belief that there is an increase in Hodgkin's disease.

In four cases there was a history of recent trauma to the involved area. One patient, a high school student, had a thorough physical examination at which time there were no significant manifestations, but three days later he was struck on the neck by a basketball, and in two weeks a node the size of a walnut, which later was proved Hodgkin's disease, appeared in that area.

SYMPTOMS

The most frequent initial symptom was lymph node enlargement (79 per cent in this series). In 8 per cent loss of weight and weakness were the major early symptoms. Nine patients complained of pruritus as the first symptom, which was present from three weeks to four years prior to the appearance of enlarged lymph nodes. In fourteen and twelve cases cough and dyspnea respectively were the first symptoms to call the attention of the patient to his condition.

PHYSICAL FEATURES

Many of the patients gave the impression of being in apparently good condition. Usually those patients whose first symptom was other than adenopathy were in much poorer condition and the disease ran a much more rapid course. This may be interpreted as evidence of the presence of deep adenopathy, which indicates a silent progress of the disease. In most instances the lymphadenopathy was the only physical change observed at the time of examination. The enlarged glands were usually arranged in a group of from three to five, firm, irregular and of varying size, some of which were often larger than 3 cm. The nodes were somewhat adherent to one another and as the disease progressed, or when recurring after irradiation, coalescence was more pronounced.

The lymph nodes most commonly involved in a simple inflammatory hyperplasia, namely, the cervical, inguinal and axillary glands, were involved with corresponding frequency in this lymphogranulomatous process. This fact, of course, does not necessarily indicate an infectious etiology. Other groups of nodes, e. g. the epitrochlear, antebrachial and popliteal, are rarely involved. In this series there were no instances of involvement of the antebrachial and popliteal glands; in only five cases did the epitrochlear nodes show enlargement, and in two of these the epitrochlear adenopathy was bilateral. This is an important aid in distinguishing this disease from lymphosarcoma, in which these glands frequently become involved. The areas most frequently involved are, in order, cervical, supraclavicular, axillary and inguinal. Three patients were attracted to their condition by a swelling on one side of the sternum. This enlargement represented involvement of the sternal lymph glands which lie at the margin of the sternum along the line of the internal mammary artery. In these three patients axillary adenopathy appeared at a later date.

A characteristic of Hodgkin's disease in its early stage is that unilateral lymph areas are attacked with greater frequency than symmetrical areas; that is, one is more apt to find enlarged glands in the corresponding supraclavicular and axillary areas than in both supraclavicular fossae.

In other forms of lymphoblastoma, such as lymphosarcoma and leukemia, the involved nodes are more apt to be symmetrically enlarged. This may possibly indicate that lymphogranuloma can spread by direct extension through the pathways of the lymphatics. Of the four patients in whom lymph nodules were found in the breast, three had positive biopsies of the corresponding axillary glands. This can theoretically be interpreted as an instance of retrograde metastasis. Another illustration of direct extension may be found in the epidural lymphogranulomatous processes occasionally found in the spinal canal on postmortem examination. The location of the epidural nodules almost uniformly corresponds to the sites of maximum visceral involvement, i. e. the mediastinal and retroperitoneal areas.

Table 2.—*Symptoms Present Before Adenopathy Was Noticed*

Symptom	No. of Cases	Symptom	No. of Cases
Loss of weight	19	Furuncles	2
Weakness	19	Fever	2
Cough	14	Pain in scrotum	1
Dyspnea	12	Pain in right hip	1
Pruritus	9	Pain in sternum	1
Pain in chest	3	Wheezing	1
Pain in back	2	Nausea	1
Ascites	2	Jaundice	1

In one instance fluctuation was present in a gland, which ruptured to discharge a thick white purulent material characteristic of caseous material from a tuberculous source. Discharging sinuses persisted in seven cases after surgical procedures. Of these seven patients one died of miliary tuberculosis, another had had a tuberculous appendix removed five years previously, a third had pulmonary tuberculosis, and some microscopic sections of a fourth showed tubercles while other sections revealed Hodgkin's disease. From these four cases one may infer that draining sinuses in Hodgkin's disease are usually due to associated tuberculosis.

INVOLVEMENT OF ABDOMINAL CAVITY

Because of their deep location on each side of the aorta, the abdominal glands involved in Hodgkin's disease are not usually accessible to palpation, even though

3. Peirce, C. B.; Jacox, H. W., and Hildreth, R. C.: Am. J. Roentgenol. **30**:145 (Aug.) 1936.
4. McHeffey, G. J., and Peterson, R. F.: Hodgkin's Disease Occurring Simultaneously in Two Brothers, J. A. M. A. **102**:521 (Feb. 17) 1934.

they are diffusely enlarged. However, at times involved nodes in the lowermost portion of the iliac fossa may be felt at the rim of the pelvis.

In this series the gastrointestinal tract was involved in two cases, the stomach in one and the sigmoid in the other. Hayden and Apfelback [5] in 1927 reviewed twenty-six cases and presented three new cases of gastrointestinal Hodgkin's disease. Only nine individuals (4.2 per cent) exhibited clinical jaundice. White, Minot and Isaacs have reported icterus of varying intensity in 10 per cent of their series.

Occasionally the involved retroperitoneal nodes may by pressure and encroachment obstruct the ureters, producing hydronephrosis. Five examples illustrating moderate hydronephrosis are available in the present series.

Of the eighty-nine early cases, splenomegaly was noted in only three and hepatomegaly in only one, but not to any marked extent. Little mention of this infrequency of splenic enlargement in early cases is noted in the literature. In fact, as a differential aid a palpable spleen in a patient of fairly good health should tend to make one hesitate in making a diagnosis of Hodgkin's disease. In the advanced stage this feature is more apt to confirm the diagnosis. Of the 123 cases in the advanced stage, the spleen and liver were palpable in sixty-four and forty-five cases respectively. In cases in which death occurred from the disease, postmortem examination almost invariably showed enlargement of the spleen. Boyd [6] records from 60 to 65 per cent of cases showing splenomegaly in Hodgkin's disease.

THORACIC INVOLVEMENT

Cough and dyspnea are the most frequent symptoms indicating mediastinal involvement. A small percentage of the cases (6 per cent) showed hoarseness which was due to paralysis of the vocal cords, caused by pressure of nodes on the recurrent laryngeal nerves. It is safe to assume that, if the supraclavicular nodes and the corresponding axillary nodes are involved, the mediastinal nodes also are probably enlarged. Wessler and Greene [7] emphasize the frequency of enlargement of the paratracheal nodes in Hodgkin's disease.

Because of the rapidity of growth of the mediastinal lymph nodes, with resultant pressure on the pulmonary and azygos veins, there is more apt to be found a pleural effusion rather than a development of the collateral chest veins. In contrast, slower growing mediastinal tumors, such as bronchogenic carcinomas of the lung with mediastinal nodes, are more apt to produce a compensatory venous dilatation on the chest wall.

Roentgenographically, the changes which take place in the mediastinum are indicated by a gradual transition from thickening of the hilar areas to a widening of the mediastinum and invasion of the adjacent lung fields. There is no uniform pathognomonic roentgenographic picture of mediastinal Hodgkin's disease. In no instance was there enlargement of the mediastinal nodes without palpable cervical, supraclavicular or axillary adenopathy.

Of the eighty-nine early cases there was involvement of the mediastinum in thirty and pleural effusion, as demonstrated by the roentgenogram, in four of these. Of the 123 advanced cases, in ninety-four there was mediastinal enlargement, with twelve instances of unilateral or bilateral pleural effusions. The explanation of the development of pleural effusion may be pressure on the pulmonary or azygos veins, or irritation by lymphogranulomatous nodules on the pleura. On five occasions a chylous fluid was obtained on aspiration from the pleural cavity, indicating obstruction of the thoracic lymph duct.

Despite many examinations of the pleural fluids for characteristic tumor cells, only the large pleural endothelial cells were found.

Autopsy material with complete histologic studies revealed that the parenchyma of the lung may become involved in the following sequence: (1) rupture of the capsule of the involved mediastinal glands with direct invasion of the adjacent lung, (2) spread of the lymphogranuloma along the interlobular and peribronchial lymphatics and (3) distribution of primary discrete nodules throughout the parenchyma of the lung.

TABLE 3.—*Frequency of Lymph Areas Involved*

Lymph Area	First Involved		Involved at Some Stage	
	Right	Left	Right	Left
Cervical	66	59	136	116
Supraclavicular	10	6	70	66
Axillary	14	10	90	88
Inguinal	24	14	74	62
Sternal	2	1	5	2
Epitrochlear	0	0	4	3

In nineteen instances the parenchyma of the lung was dotted with nodules ranging in size from a ten cent piece (18 mm.) to a half dollar (30 mm.). The roentgenogram of such a case ordinarily could not be differentiated from the roentgenogram of metastatic carcinoma. One interesting case reported by Rubenfeld [8] closely resembled a bronchogenic carcinoma with atelectasis, with no palpable adenopathy. It regressed under high voltage irradiation and six years later showed a generalized lymphadenopathy followed by death. Necropsy showed diffuse Hodgkin's disease.

CUTANEOUS MANIFESTATIONS

The presence of cutaneous manifestations in Hodgkin's disease has been appreciated for many years. In the group of cases under discussion, the skin was involved in eighty (38 per cent). There were gradations from a simple pruritus to multiple nodules and occasionally a generalized exfoliative dermatitis. Nine patients stated that the pruritus was present before palpable adenopathy appeared. The pruritus may exist alone or in conjunction with other morphologic cutaneous lesions. Often the annoying itching causes the patient to inflict numerous scratch marks. Another frequent feature is the presence of many superficial ulcerated papules similar to those found in scabies. Herpes zoster, present in nine cases, usually indicates involvement of nodes at the corresponding spinal level in the mediastinum or retroperitoneum. Two cases exhibited a generalized exfoliative dermatitis. One case history is worthy of brief mention; the patient noticed, nine months prior to his admission, eczematous lesions on his upper extremities which gradually extended until the entire body was red, exfoliated and weeping. Enlarged lymph glands were noticed but were clinically diagnosed as chronic inflammatory in nature. Various ointments and injections were tried without success. Finally an axillary node was removed and the diagnosis

5. Hayden, Helen C., and Apfelback, C. W.: Gastrointestinal Lymphogranulomatosis, Arch. Path. 4:743 (Nov.) 1927.
6. Boyd, William: The Pathology of Internal Diseases, Philadelphia, Lea & Febiger, 1931.
7. Wessler, Harry, and Greene, C. M.: Intrathoracic Hodgkin's Disease, J. A. M. A. 74:445 (Feb. 14) 1920.
8. Rubenfeld, Sidney: Radiology 22:627 (Nov.) 1934. Rubenfeld, Sidney, and Clarke, Eugene, ibid. 28:614 (May) 1937.

of Hodgkin's disease was made. Biopsy of the skin lesion revealed a diffuse infiltration of lymphocytes. It is wise to suspect cases of generalized exfoliative dermatitis not responding to ordinary therapy as possible cutaneous manifestations of Hodgkin's disease.

In a review of 333 cases of Hodgkin's disease (Wallhauser [8]), some type of cutaneous manifestation appears in ninety-eight cases (29 per cent). In contrast with the frequent involvement of the skin, the mucous membranes remain conspicuously free of involvement. Another lymphatic area rarely involved is the tonsil. In our 212 cases there was no instance of involvement of the tonsils. This is an important aid in distinguishing this disease from lymphosarcoma.

OSSEOUS INVOLVEMENT

Of the 212 patients under consideration, fourteen (6.6 per cent) showed roentgenographic disturbances of the osseous system, suggestive of lymphogranulomatous involvement. Craver and Copeland,[9] in an analysis of 172 cases of Hodgkin's disease, found twenty-seven (15.7 per cent) in which there was involvement of the bone.

In the present series x-ray films of the skeleton were taken only when pain or deformity warranted such an examination. In several instances routine films of the chest suggested lymphogranulomatous foci in the bony thorax. If complete skeletal studies were made in every case a higher frequency of bone involvement might have been demonstrated.

TABLE 4.—*Frequency of Cutaneous Manifestations*

Type of Involvement	No. of Cases	Type of Involvement	No. of Cases
Pruritus	34	Furuncles	3
Dryness, with superficial desquamation	20	Urticaria	3
Pigmentation	15	Exfoliative dermatitis	2
Herpes zoster	9	Multiple bullae	1

The most frequent areas of involvement were, in the order named, vertebral column, pelvis, ribs, upper ends of the femurs, and sternum. Less frequently the ends of the humeri and other long bones and the skull were involved. When the long bones were involved the deposits were most frequently in the proximal and distal thirds. It is worthy of note that the portion of the bone most frequently involved corresponds to the actively hemopoietic portion of the bone marrow.

There was no characteristic roentgenographic picture of these granulomatous foci. They were most frequently osteolytic, closely resembling metastatic carcinoma. Less frequently osteoblastic changes were found, although it was not uncommon to have a combination of the two. The bone lesions of Hodgkin's disease, in comparison with metastatic carcinoma, are less painful and more radiosensitive.

Of the nine instances of vertebral involvement, the dorsal portion was involved in seven and the lumbar in two. Collapse of the vertebral body occurred once, but the intervertebral disk was spared in all nine cases.

That Hodgkin's disease may affect the bone without demonstrable significant lymphadenopathy is reported by Krumbhaar [10] and Herscher.[11] Each one reported a case in which there were lesions in the bone marrow without apparent involvement of the lymph nodes.

9. Craver, L. F., and Copeland, M. M.: Changes in the Bone in Hodgkin's Granuloma, Arch. Surg. **38**:1062 (June) 1934.
10. Krumbhaar, E. B.: Am. J. M. Sc. **182**:764 (Dec.) 1931.
11. Herscher, Harry: Am. J. Roentgenol. **35**:73 (Jan.) 1936.

NEUROLOGIC DATA

An occasional complication occurring during the course of Hodgkin's disease is paralysis. Weil [12] reported forty-three cases of paralysis due to involvement of the spinal canal. In our series ten instances of transverse myelitis, eight in the dorsal segments and two in the lumbar levels, were found. The greater frequency of dorsal involvement may be explained by the greater incidence of mediastinal lymphadenopathy as compared to abdominal manifestations. The pathology of this disturbance can best be understood by reference to the clinical histories:

CASE 1.—A man aged 23 sought admission in January 1930 because of a lump in the right axilla of three months' duration; high voltage irradiation was given and the enlarged nodes disappeared. Two years later nodes appeared in the left axilla and an x-ray film revealed a widening of the mediastinum. High voltage therapy was started, but the patient did not return to complete the course, having received as little as 200 roentgens to each area. Eight months later pain appeared in the upper portion of the back and the patient complained of a tightening in the chest wall (girdle sensation). Shortly after, paralysis occurred at the level of the sixth dorsal vertebra. At autopsy the essential observations were as follows: A retropleural mass extended back into the paravertebral space, eroding the vertebral column at the junction of the sixth and seventh vertebrae. The lymphogranulomatous process was continuous with nodules in the epidural space and compressed the spinal cord and its membranes.

CASE 2.—A man aged 49 was admitted in September 1934, complaining of enlarged cervical and inguinal glands of three months' duration. High voltage irradiation was given to the involved areas with regression of the nodes. In December 1934 the patient collapsed on the street and examination showed a spastic diplegia of the lower extremities with retention of feces and urine. A distinct sensory change was found at the level of the sixth dorsal spine. High voltage irradiation was given, with 1,200 roentgens, after which slight improvement was noted. In February 1935 a laminectomy was done, at which time scar tissue was seen encircling the spinal cord at the site of the myelitis. Following this surgical procedure a moderate amount of improvement was noticed.

In two other cases herpes zoster corresponding to the same spinal level preceded the paraplegias. From this it may be assumed that herpes zoster was caused by the lymphogranulomatous process surrounding and invading the ganglions corresponding to the peripheral areas involved. It may be concluded with reservation that the occurrence of herpes zoster in Hodgkin's disease is an indication for prophylactic high voltage therapy to the spinal column to prevent the development of a paraplegia.

It is believed that the lymphogranulomatous process extends along the lymphatics of the nerve roots and produces myelopathy (1) by direct compression of the cord and (2) by mechanical obstruction of its blood and lymphatic supply, either within the intervertebral foramens or outside the spinal canal. The strangulation of the spinal arteries in the granulomatous tissue is by far the most important cause of the myelomalacia. Pathologically this accounts for the frequent poor results obtained after irradiation in the paraplegia of Hodgkin's disease. The lymphogranulomatous tissue disappears under the effect of radiant energy but is replaced by scar tissue, which in turn encircles the nutrient vessels of the spinal cord. Death usually results from one to six months after the onset of paraplegia. Paraplegia may also be caused, but much less fre-

12. Weil, Arthur: Spinal Cord Changes in Lymphogranulomatosis, Arch. Neurol. & Psychiat. **26**:1009 (Nov.) 1931.

quently, by collapse of involved vertebrae producing angulation and compression of the cord. In this series there was no instance of paraplegia occurring on this basis.

BLOOD PICTURE

There is considerable difference of opinion as to the blood picture in Hodgkin's disease. Wiseman [13] states that Hodgkin's disease usually, but not always, possesses a characteristic blood picture. He interpreted these characteristics as suggesting an alteration of the reticulum cell-monocyte maturation cycle. However, most observers feel that the changes in the blood are neither typical nor constant.

The blood studies in this series have been done by many workers, sometimes prior to, at other times during or after, irradiation. Usually there was a normal total leukocyte count or a slight leukopenia. In the more advanced type the total white count was increased. One patient, in a late stage, had a total white count of 52,000 cells with no evidence of infection. There was an increase of neutrophils in nearly all cases, with a relative increase of monocytes and diminution in lymphocytes. About 20 per cent of cases showed an eosinophilia; the highest eosinophil count was 28 per cent of 27,000 white blood cells. Secondary anemia was a characteristic feature, and its severity was usually comparable to the rapidity of the disease. With the institution of irradiation there resulted a drop in the total leukocyte count (from 3,000 to 5,000 white blood cells) with a further lymphopenia.

THE OCCURRENCE OF FEVER

In 1887 Pel [14] and Ebstein [15] noticed a periodic pyrexia which occurred in cases of advanced Hodgkin's disease. They described a remittent type of elevated temperature, which rises in from three to five days until it reaches a level of about 103 F., maintaining itself for approximately five days and then gradually falling to normal in a similar period. At the end of ten days or so it may again begin to rise. These periodic bouts of fever may extend over many months or even a year.

The more common type of pyrexia is the low grade continuous variety in which the temperature mounts to 100 or 101 F. each evening. If the disease progresses, a higher peak is reached and terminally a temperature of from 104 to 105 F. is observed. In our series an elevated temperature occurred in the presence of widespread generalized adenopathy, but occasionally it was seen in those cases in which the adenopathy was limited, especially to the abdominal nodes.

In this group of cases the continuous type of pyrexia was the usual picture and the Pel-Ebstein variety was uncommon. However, one of the most characteristic features was the relationship of the pulse to the temperature curve. In almost all cases the pulse was proportionately at a considerably higher level. If the temperature varied between 98 and 102 F. the pulse could often be counted at a rate of from 90 to 120 per minute. By this relationship it was often possible to detect cases in which the pyrexia was due to concomitant infection, e. g. respiratory or urinary infection, when the pulse and temperature curves were approximately on the same level.

Of the patients dying in the hospital, about 75 per cent had had a prolonged pyrexia. Not infrequently patients with generalized adenopathy and splenic enlargement died, having had little or no fever during the course of the disease. This suggests that there is some other factor besides the central necrosis of a gland to account for the elevation of the temperature.

DURATION OF LIFE

The clinical course of Hodgkin's disease may be rapidly fatal or slowly progressive. The average duration of life of the 123 patients who died under observation was 32.06 months, dating from the onset of symptoms. Of these 123 patients eighty-six were male, and the duration of life was 31.1 months; thirty-seven were female and their span of life after the first symptoms was 34.3 months. Of this group the shortest course was two and a half months and the longest eleven years. Almost all the patients received some form of radiation. Many of them received inadequate therapy either on account of their inability to tolerate therapeutic dosage or because of failure to return to complete their outlined courses. A few received surgical treatment in addition. In the 123 cases followed to death, the duration of life after the institution of treatment was 23.8 months. The average length of time that the patient had symptoms before receiving radiotherapy was 8.26 months.

Between 1926 and 1931 inclusive, 109 patients were admitted, of whom eleven, or 10 per cent, lived five years or more after irradiation. Craver [16] showed a survival in fifteen cases (12 per cent) of five years or over in 125 proved cases of Hodgkin's disease.

Minot and Isaacs in 1926,[17] in their analysis of 410 cases of lymphoblastoma, came to the following conclusions: "Thus it might be considered that irradiation had not influenced the duration of the cases lasting six or more years, yet had doubled the chances of persons from 25 to 45 years old having their disease from three to six years, and that it had influenced some groups less markedly, and others not at all or unfavorably."

In those few cases in which surgical removal was attempted and was followed by irradiation, no untoward results or greater spread of the disease was noticed. On the assumption that death is caused by a generalized toxemia, the removal of the involved superficial lymphadenopathy theoretically should prolong life, but from a practical standpoint this procedure is obviously inadvisable.

Examination of the microscopic sections lent little or no aid in determining prognosis. Many of the more cellular types ran prolonged courses, while those exhibiting fibrous reaction had a short duration, and vice versa.

SUMMARY

1. This study consists of an analysis of 212 proved cases of Hodgkin's disease, 126 from the Radiation Therapy Department of Bellevue Hospital and eighty-six from the New York City Cancer Institute, during the years 1926-1936 inclusive.

2. Hodgkin's disease shows a preponderance in men between the ages of 20 and 40 years. Its occurrence in girls under 15 years of age is unusual.

3. There were no demonstrable predisposing factors in any of the cases.

4. In 79 per cent of the series lymph node enlargement was the first abnormality drawing the attention of the patient to his condition. Nine patients first complained of pruritus from three weeks to four years prior to the appearance of the enlarged glands.

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14. Pel, P. K.: Berlin klin. Wchnschr. **24**: 644, 1887.
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16. Craver, L. F.: Am. J. M. Sc. **188**: 609 (Nov.) 1934.
17. Minot, G. R., and Isaacs, Raphael: Am. J. M. Sc. **172**: 157-173 (Aug.) 1926; Lymphoblastoma (Malignant Lymphoma), J. A. M. A. **86**: 1185 (April 17) and 1265 (April 24) 1926.

5. Unilateral lymphadenopathy was more common than symmetrical involvement in early cases.

6. Discharging sinuses occurred in seven cases, possibly indicative of a concomitant tuberculosis.

7. There was infrequency of splenomegaly in early cases, usually palpable enlargement of the spleen in advanced cases, and almost 100 per cent involvement in postmortem studies.

8. There was no uniform pathognomonic roentgenographic mediastinal picture of Hodgkin's disease. In no instance was there enlargement of the mediastinal nodes without palpable cervical, supraclavicular or axillary adenopathy.

9. In nineteen instances the parenchyma of the lung was dotted with nodules, varying in size from a ten cent piece to a half dollar.

10. There was involvement of the skin in eighty cases (38 per cent), in which there appeared gradations from a simple pruritus to multiple nodules and occasionally a generalized exfoliative dermatitis.

11. Fourteen individuals (6.6 per cent) showed roentgenographic disturbances of the osseous system. There was no uniformly pathognomonic roentgenographic sign of these granulomatous foci. They were most frequently osteolytic, closely resembling metastatic carcinoma.

12. There were ten instances of diplegia, eight at the dorsal and two at the lumbar level, corresponding to the presence of mediastinal and retroperitoneal lymphadenopathy. The transverse myelitis may be explained by an epidural invasion with a resulting choking off of the blood supply to the spinal cord. Little improvement was noticed after high voltage irradiation, the lymphogranulomatous extension being replaced by scar tissue.

13. In the blood studies, the most constant feature was a diminution in the lymphocytes with an increase in monocytes.

14. A continuous low grade type of pyrexia was present in most cases. The Pel-Ebstein variety was uncommon. The marked elevation of the pulse, out of proportion to the temperature, was striking in the advanced cases.

15. The average duration of life after onset of symptoms of the 123 patients who died under observation was 32.06 months. The average duration of life after the institution of therapy was 23.8 months. Eleven patients (10 per cent) lived five years or more after irradiation.

16. The disease varies markedly in virulence, clinical course and response to treatment.

80-24 Broadway, Elmhurst, Long Island, N. Y.

Good Posture a Complex Problem.—A fundamental point about standing correctly is that good posture is not purely a matter of the feet. It is a question of muscle balance and transmission of body weight through the optimum line of carriage. In other words, the center of gravity must come through the bony structure of the body in such a way as to cause the least strain. The mechanics alone involved in this complicated problem are sufficient to baffle a mathematician, since a single joint has so many possible mechanical positions that are still within normal and each muscle acting at that joint has a stress and pull that is variable to an immeasurable extent. The muscles are controlled by the nerves, and these nerves work on a reflex basis, so that the problem becomes very complicated if it is traced to its ultimate scientific explanation.—Hauser, Emil D. W.: Diseases of the Foot, Philadelphia, W. B. Saunders Company, 1939.

HIGH LIGATION OF THE FEMORAL VEIN IN AMPUTATIONS OF THE LOWER EXTREMITIES

A PRELIMINARY REPORT BASED ON TWENTY-EIGHT AMPUTATIONS OF THE THIGH

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WASHINGTON, D. C.

The mortality rate for amputation of a lower limb for vascular gangrene has remained excessively high, although it was one of the earliest major operations to be performed. Even the introduction of aseptic surgical technic and safe anesthetic agents has failed to reduce this rate in proportion to most other standard operations. There are many factors influencing the mortality of amputation of the lower extremities, but one stands out conspicuously: the development of postoperative pulmonary complications.

During a five year period ending in December 1933 there were 171 amputations of the extremities for primary vascular gangrene (arteriosclerotic, diabetic and thrombo-angiitis obliterans) at the New Orleans Charity Hospital.[1] Sixty-seven of these patients died, a mortality of 39.1 per cent. There were twenty-four definite pulmonary complications among this group. Following this study an earnest effort was made to reduce the extremely high death rate. A check-up three years later showed that there had been 104 amputations for arteriosclerotic gangrene with thirty deaths, a rate of 28.8 per cent.[2] Again pulmonary complications were by far the most important cause of death, seventeen of thirty cases. Fifteen of these were classified as pneumonia and two as pulmonary embolism. A study of the onset and clinical course of these cases led me to believe that some classified as pneumonia were really due to multiple pulmonary emboli with secondary pneumonitis. In other words, the pneumonia was embolic rather than infectious in origin. Dissection of the stumps of patients dying following amputation revealed that in certain cases an antemortem clot had formed in the stump of the femoral vein. The thrombus extended several inches up the vein in some and for a shorter distance in others. When infection or recurrent gangrene was present in the stump, phlebitis was found involving the lower segment of the vein. Undoubtedly this could be the source of small or large septic emboli.

Homans [3] has shown that thrombosis of the deep veins of the lower leg is a much greater danger than femoro-iliac thrombophlebitis. He has demonstrated that a clot forming in the deep veins of the leg extends upward to the popliteal vein, and here the clot swings back and forth in this dilated portion and may easily be torn off and swept into the general circulation and become lodged in the lungs. I believe that a similar set of circumstances may at times develop in the stump of the femoral vein following amputation. When a vein is ligated, a clot usually forms in the distal end and extends proximally only to the point where a tributary joins the vein. After amputation a clot may form in the narrowed lower section of the femoral vein if the

From the Department of Surgery of the Gallinger Municipal Hospital.

1. Veal, J. R., and McFetridge, Elizabeth: The Surgery of Gangrene of the Extremities, Surg., Gynec. & Obst. 60: 840-847 (April) 1935.
2. Veal, J. R.: Factors in the Mortality Rate of Arteriosclerotic Gangrene, J. A. M. A. 110: 785-789 (March 12) 1938.
3. Homans, John: Venous Thrombosis in the Lower Limbs: Its Relation to Pulmonary Embolism, Am. J. Surg. 38: 316 (Nov.) 1937; Thrombophlebitis in the Legs, New England J. Med. 218: 594 (April 7) 1938.

tributaries are small or too few in number and may extend upward to the large dilated portion and be swept into the general circulation. If there should be an infection of the stump and a phlebitis involving the lower femoral vein, septic emboli may be given off.

There are certain anatomic variations in the deep veins of the thigh that predispose to thrombus formation in the femoral vein after amputation through the thigh at any level. The femoral vein begins at the inguinal ligament and runs an oblique course down the inner aspect of the thigh to terminate in the popliteal vein. Dissection of these veins in some twenty cadavers revealed many variations in the tributaries to the femoral vein. The main tributaries are the deep profunda and great saphenous veins. In its upper position there are several smaller named tributaries, and throughout its course it receives muscular branches which vary widely in size, number and distribution. It gradually increases from below upward but enlarges suddenly just above the entrance of the deep profunda and saphenous veins. The saphenous is the most constant in size and point of entrance into the femoral vein. Because of its high point of entrance, its superficial position and its numerous branches it plays little part in the formation of a thrombus in the femoral vein after amputation. The deep profunda and the muscular tributaries below the saphenofemoral junction, however, are very important in the formation of a postamputation femoral thrombosis. From these dissections I have been able to divide the various patterns of the venous channels into four distinct

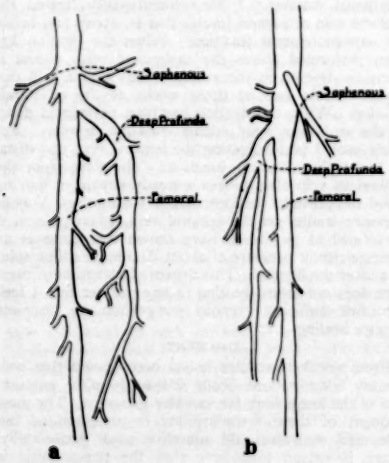

Fig. 1.—Schematic drawing from dissections of the thigh showing two patterns of the venous channels in which the tributaries of the femoral are numerous and well distributed. Such distribution of the tributaries prevents the formation of a large thrombus after ligation of the femoral vein.

groups according to the number, size and distribution of the tributaries to the femoral vein from the saphenofemoral junction to the popliteal vein. In grouping the various patterns I have been primarily concerned with the deep profunda and the unnamed muscular branches that join the femoral vein in a bizarre fashion in its course down the thigh.

In group 1 (fig. 1 *a*), apparently the most common, the deep profunda vein is almost as large as the femoral vein and joins it as a single branch just below the saphenofemoral junction. The muscular tributaries are numerous and large and present a fairly even distribution. There is little space between the branches, so

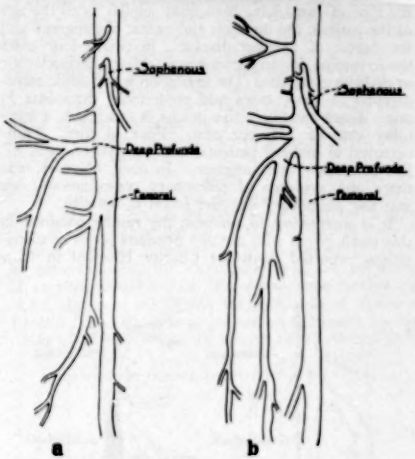

Fig. 2.—Schematic drawing of the types of venous patterns of the thigh, as described under groups 3 and 4. Note the scant number of tributaries to the femoral vein below the mouth of the deep profunda vein. Such distribution of the tributaries favors the formation of a long thrombus after ligation of the lower femoral vein.

that the femoral vein receives a good flow of blood at all levels. In group 2 (fig. 1 *b*) the deep profunda is made up of several large branches which unite to form a single tributary just before entering the femoral vein. The smaller tributaries again are found to be numerous and well distributed. In group 3 (fig. 2 *a*) the deep profunda is divided into two branches, which join the femoral at different levels. The tributaries to the femoral vein distal to the lowest branch of the profunda are very few in number, are quite small and leave long portions of the vein devoid of any afferent branches. In group 4 (fig. 2 *b*) the deep profunda vein again enters at a high level as a large single branch, but there are practically no other tributaries until the popliteal vein is reached. In groups 1 and 2 ligation of the femoral vein at any level is not apt to lead to an extensive thrombosis because there are sufficient tributaries to insure a constant flow of blood into it above the ligated point (fig. 3 *a*). In groups 3 and 4 ligation of the lower femoral vein is likely to cause the development of a long thrombus extending from the point of ligation upward to the entrance of the deep profunda branch (fig. 3 *b*). It is in these two groups that there is a real anatomic basis for the formation of a dangerous thrombus after amputation of the limb.

From these studies I decided to attempt to overcome the danger of embolism from thrombus formation in the femoral stump by preliminary high ligation of the femoral vein. It is impossible to determine the pattern of the deep veins of the thigh without exploration; therefore I consider it necessary to perform this high liga-

tion in all amputations of the lower extremities. I have now employed this procedure in twenty-eight consecutive amputations of the thigh, and not a single pulmonary complication has developed. The first nine patients were operated on at Charity Hospital in New Orleans and the remaining patients at Gallinger Municipal Hospital in Washington, D. C. In the two hospitals the type of cases have been quite similar as to the age of the patient, the duration and extent of gangrene and the degree of vascular disease. In twenty-four cases the indication for amputation was either arteriosclerotic or diabetic gangrene. The indication was chronic osteomyelitis in three cases and epidermoid carcinoma in one. There have been five deaths in this group, a mortality rate of 17.8 per cent. Four of these deaths occurred in diabetic patients, and one patient, aged 87, had arteriosclerotic gangrene. In none, however, was there any evidence of pulmonary complications, nor was any pulmonary disorder found at autopsy.

It is interesting to compare the results obtained in this small group with my two previous series of amputations reported from the Charity Hospital in New

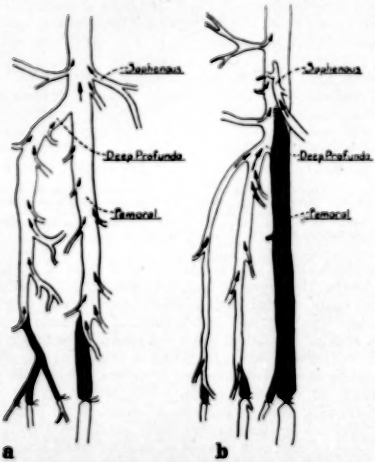

Fig. 3.—Schematic drawing showing the influence of tributaries on the extent of thrombus formation after ligation of the lower femoral vein: a, numerous well distributed collaterals limiting the thrombosis; b, inadequate tributaries allowing a long thrombus to form and project into the dilated portion of the femoral vein above the entrance of the deep profunda vein.

Orleans. In the first series of 171 cases the mortality rate for amputation of the thigh was 55.5 per cent (forty-five cases with twenty-five deaths). In the second series the mortality rate for amputation of the thigh was 33⅓ per cent (sixty-nine cases with twenty-three deaths). In the present series the entire group required amputation above the knee, and yet the mortality has been reduced to 17.8 per cent. In the two groups of 275 amputations from Charity Hospital, there were ninety-seven deaths, of which forty-one (42.2 per cent) resulted from some type of pulmonary complication. In other words, in 14.9 per cent of the entire series a fatal pulmonary complication developed. As I have already stated, the type of case in these three groups has been similar. The type of amputation has been the modified circular in almost every case. The method of preoperative preparation and postoperative care for the last two groups has been practically the same. The essential difference in their management has been the preliminary high ligation of the femoral vein. The striking results of this procedure in eliminating pulmonary complications in the present series of twenty-eight cases seems worthy of further study and application.

The technic of ligating the femoral vein above the deep profunda is usually quite simple and requires only a few minutes. The leg and entire thigh are prepared in the usual manner. The sterile drapes are applied so that the femoral triangle is exposed. The femoral vein can be easily approached in the femoral triangle, as it is most superficial in this region. The vein lies medial to the femoral artery and is enclosed in the femoral sheath. The best landmark is the saphenous vein. This vein joins the femoral vein about 1½ inches below the inguinal ligament. By exposing the saphenous vein at this level through a short vertical incision, one can follow it down to the femoral vein. In some cases the lymph glands will be found to be enlarged, and if they obstruct the exposure of the femoral vein they must be excised. After the vein has been exposed, it is ligated with braided silk just distal to the saphenofemoral junction. I have found that a medium size, curved, noncutting needle which has had its point removed answers the purpose admirably for passing the ligature. As soon as the ligation has been completed, the deep tissue is closed with plain catgut and the skin closed with silk. The amputation is then performed in the usual manner. I have intentionally ligated the femoral vein at several levels; that is, above and below the saphenofemoral junction. When the ligation has been performed above the saphenous vein, edema is likely to develop in the stump. This edema will disappear within two or three weeks as the collaterals develop. When the ligation has been performed distal to the saphenous vein, edema does not develop. For this reason I prefer ligating the femoral vein just distal to the saphenofemoral junction. The flow from the saphenous vein also insures a steady stream of moving blood and prevents the formation of a thrombus. Venous pressure studies on the femoral vein, when ligation is performed at this level, have shown that there is an average rise of pressure of about 20 mm. of saline solution after the ligation. This degree of elevation of pressure does not retard healing in any manner but, I feel, furnishes sufficient venous congestion to promote prompt healing.

COMMENT

From previous studies it has been shown that pulmonary complications occur frequently after amputation of the lower limb for vascular gangrene. The most frequent of these complications is pneumonitis, but pulmonary embolism and infarction occur occasionally. There is reason to believe that the pneumonitis is embolic, and the source of the emboli is the stump of the femoral vein. In some subjects the femoral vein is almost devoid of tributaries from the entrance of the deep profunda to the origin of the popliteal vein. This anatomic arrangement of the tributaries predisposes to thrombus formation in the long femoral stump after amputation. The clot may extend upward to the dilated portion of the femoral vein and be torn off and swept into the circulation. If a local phlebitis occurs in the stump, a shower of small septic emboli may be swept into the circulation and become lodged in the

lungs and produce pneumonitis. By ligating the femoral vein just distal to the saphenofemoral junction one eliminates the danger of embolism from the femoral stump. The results obtained from this procedure in twenty-eight consecutive amputations of the thigh seem to bear out these assertions.

Nineteenth Street and Massachusetts Avenue S.E.

CUTANEOUS CARCINOMA DIAGNOSED CLINICALLY WITHOUT BIOPSY

RESULTS OF TREATMENT IN A CONSECUTIVE SERIES

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AND
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Since large numbers of cutaneous carcinomas are treated without a biopsy having been made and since reports on extensive series of such tumors are relatively few, we have collected data from a series of 829 cutaneous carcinomas diagnosed clinically but without a biopsy. Until comparatively recently it has been customary at the Huntington Hospital to treat cancer of the skin without a biopsy. As a result, the tumors available for histologic study were for the most part those treated by surgery, the large number treated by radiation thus being excluded. Since surgery was very often the method of last resort after poor response to irradiation—and for treatment of metastases—it is obvious that our studies based on histologically verified cutaneous tumors must necessarily give a biased picture of the results of treatment. For this reason we felt that a review of the end results in a series of cases of carcinoma of the skin in which a biopsy was not done would be necessary to give a complete knowledge of the behavior of cancer of the skin and the results to be expected from different forms of treatment.

All patients entering the Collis P. Huntington Memorial Hospital from 1928 to 1932 inclusive with cancer of the skin not histologically verified are included in the series. Malignant conditions of the mucocutaneous junctions are not included. This series may be contrasted with reports on histologically verified basal cell carcinomas and epidermoid carcinomas already presented.[1] Every effort was made for a complete follow-up on each patient. If a patient was lost, inquiries were sent to the friend whom patients were required to mention on admission, and to the physician referring the patient. If the patient was still untraced, letters were sent to the town clerk requesting the cause of death given on the death certificate, if such existed. The death records of the Massachusetts Division of Vital Statistics were also searched for all untraced patients. There are 829 clinical cutaneous carcinomas in 757 cases in the present series. There were forty-five lesions without a follow-up of one year, and 134, or 16.2 per cent, patients were lost by the end of the fifth year. Fifty-one patients who had more than one lesion are included in this series. A subsequent paper will deal with multiple lesions in detail.

From the Collis P. Huntington Memorial Hospital.

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SITE OF LESION AND SEX OF PATIENT

The distribution of the lesions arranged according to age and sex is shown in table 1. The number of lesions on sites such as the ear and extremities, which are usually treated surgically, is low. The numbers of males and females are strikingly similar. However, this is probably not a true reflection of the relative frequency in the two sexes but rather due to the fact that women are more aware of lesions on the face than are men and so tend to appear with smaller lesions, which are less frequently submitted to biopsy. However, in the fourth decade even in this series there are twice as many lesions in males and more lesions of the ear in males as well, although the preponderance here is not nearly so striking as in the series of patients on whom a biopsy was done.

AGE

The number of lesions in quinquennial groups is shown in chart 1, as is the number of additional lesions present on the same patient. The difference in the two gives the number of patients. The median age for males by patients is 63, the mean 62.80 and the coefficient of variation 20.60 ± 0.04. For females the median age is 64, the mean 63.97 and the coefficient of variation 19.10 ± 0.04. By lesions, the values for males are 64, 63.28, 20.57 ± 0.04 and for females 65, 64.44 and 18.94

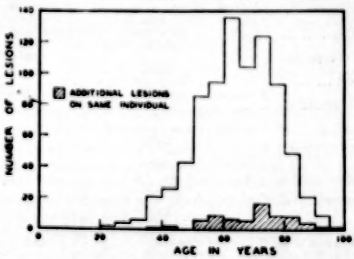

Chart 1.—Age distribution: 825 lesions.

± 0.04 respectively. The values were computed on the age when the patient was first seen. Four patients did not give their age. The incidence rises with age, as may be seen from chart 2, in which the frequency of lesions treated is expressed in terms of living 1930 Massachusetts population per quinquennial group.

SIZE

Size is expressed as the greatest surface diameter mentioned in the description of the tumor on admission to the hospital. Mention of the depth of the lesion was seldom made, owing to the difficulty of estimation, although the clinical importance of penetration beneath the skin is fully as great as that of lateral extent.

In table 2 we present a correlation of the size of the cancers when first seen with the type of previous treatment. Nearly two thirds of the lesions were 1 cm. or less in diameter. A few very large lesions were found. In table 3 the recurrences and fatal cases are correlated with the size of the lesion when first seen.

The rate of recurrence is discouragingly high—almost one in every eight lesions treated. There is naturally a fairly close correlation with the size of the lesion. Eleven per cent of the smaller lesions recurred, whereas 30 per cent of the larger lesions recurred. This three-

fold increase in recurrence with increasing size is dwarfed by the enormous increase in mortality. There is over a seventyfold increase from lesions under 1 cm. in diameter to those over 4 cm. in diameter. The carcinoma mortality of patients with lesions under 1 cm. in diameter was 0.4 per cent and of those with lesions over 4 cm. in diameter it was 35 per cent. While part of this enormous variation may be due to the inclusion of benign lesions, such as keratoses, among the smaller tumors, none the less there is startling evidence of the danger of delaying therapy in this group of tumors as well as in others.

METHODS OF TREATMENT

Of the 829 lesions, 778 were treated by radium alone, twenty-one by radium plus x-rays, fifteen by x-rays alone, six by radiation plus surgery and nine by surgery alone. Thus it is seen that the series is almost entirely composed of radium-treated lesions. X-rays were usually used only palliatively. The recent trend is toward more extensive use of x-rays. This trend is due to economic reasons in part—for roentgen therapy has decreased in cost and increased in efficiency—and in part to the more even distribution of irradiation that can be obtained with the x-rays, owing to the distance of the source in the lesion treated, the all too frequent danger with the surface application of radium thus being obviated of giving a dose adequate to heal the superficial portion of the lesion but inadequate to check the disease at its base. The radium therapy consisted mainly in the surface application of radon in 0.3 mm. of steel. The dosage was from 10 to 15 millicurie hours to one or more areas and was repeated if healing did not occur or suspicious areas persisted. For the larger lesions filters were occasionally used and radon seeds implanted. For six lesions greater than 2 cm. seeds were used, for three x-rays and for five combined x-rays and radium. The technic has been previously described by Daland.[2]

PREVIOUS TREATMENT

The treatment prior to the patient's entering the hospital was quite varied. To attempt to evaluate the effects of previous treatment, table 4 was made. When the cancer deaths are considered it seems that inadequate initial irradiation is detrimental. This is due in part to the progress of the lesions, since inadequate therapy permitted recurrence, and in part to the less satisfactory response that is obtained by irradiation once a lesion has been treated and has recurred. These data are not entirely valid, however, for the majority of inadequately treated and palliatively treated lesions resulting in death are in the group previously irradiated.

RECURRENCES

Lesions were considered recurrent only if healing had previously occurred. Thirteen per cent of the lesions followed one year were known to recur. This does not include the thirty-two cases of persistent lesions which never healed. The recurrences per lesion at the various locations showed no definite predilection for any particular site. From table 3 it can be seen that recurrences are more apt to occur in the larger lesions. From table 5 it is seen that half the recurrences occurred within the first year. Recurrences after the third year are uncommon and are difficult to differentiate from a second independent tumor. Of seventy-one recurrences in which treatment was carried out there were forty-three, or 61 per cent, three year cures and twenty-eight,

TABLE 1.—*Distribution of Lesions*

Age by Decades	Total		20-29		30-39		40-49		50-59		60-69		70-79		80-89		90-99	
Sex	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
Totals	418*	411	3	3	14	13	47	22	91	90	115	127	99	120	44	26	3	6
Upper part of face 30.0%	143	105	..	2	6	3	18	7	38	20	29	31	34	32	14	9	2	1
Ear 1.2%	8	2	..	..	..	..	..	..	..	..	4	..	3	2	1	..	..	..
Nose 32.5%	133	147*	1	..	2	4	14	7	28	29	56	44	28	40	14	9	..	2
Skin of upper lip 2.9%	7	17	..	..	1	..	1	..	4	5	1	7	..	3	..	2	..	..
Cheek † 25.5%	102	110	2	1	3	5	12	8	15	18	37	39	22	28	11	6	..	5
Lower part of face 1.9%	8	8	..	..	1	1	..	..	2	1	3	3	1	3	1	..	..	..
Neck 2.4%	8	12	..	..	..	..	..	..	..	2	1	1	6	9	1	..	..	..
Scalp 1.0%	6	3	..	..	..	..	1	..	1	2	1	1	1	..	2	..	..	..
Trunk 1.5%	6	4	..	..	1	..	..	..	1	3	3	..	1	1	..	..	..	..
Extremities 1.3%	7	3	..	..	..	..	1	..	2	..	..	1	3	2	..	..	1	..

* Two cases in which age was unknown.

† Cheek includes tumors poorly localized from the upper and the lower part of the face.

TABLE 2.—*Size When First Seen and Previous Treatment*

Size, Cm.	0-1	1.1-2	2.1-3	3.1-4	4.1 or More	Not Stated	Total
Previous irradiation * 6.9%	26	10	3	3	7	8	57
	5.1%	5.6%	12.5%	25%	35%	9.5%	
Previous surgical intervention † 4.9%	23	9	0	1	2	6	41
	4.4%	5.1%	0%	8%	10%	7.1%	
Other previous treatment ‡ 12.1%	52	29	3	2	5	9	100
	10.2%	16.4%	12.5%	17%	25%	10.7%	
No previous treatment 76.2%	411	129	18	6	6	61	631
	80.2%	72.9%	75%	50%	30%	72.6%	
All cases 100.0%	512	177	24	12	20	84	829
	61.8%	21.3%	2.9%	1.4%	2.4%	10.1%	

* Previous irradiation refers to roentgen irradiation.

† Previous surgical intervention includes electrodesiccation.

‡ Other previous treatment refers to salves, ultraviolet rays and the like.

2. Daland, E. M.: End Results of Radium Treatment of Skin Cancer, J. A. M. A. 86:471 (Feb. 13) 1926.

or 40 per cent, five year cures. This percentage for five year cures of recurrences is low because the five year period has not elapsed for some of the patients. Of the twenty-seven deaths from cancer seven, or 26 per cent, occurred after primary healing. Recurrences were more frequent if there had been previous irradiation, owing to healing of the surface of the lesion without destruction of its lower portion.

END RESULTS

Table 5 gives the status of the lesions after treatment. The status after five years is shown in chart 3. In cases of cures and recurrences, the duration given is that after the last treatment. The status after recurrence is not definite enough in many cases, and for that reason the recurrence column is cumulative. The duration to death with disease is reckoned from the time

TABLE 3.—*Size When First Seen, Recurrences and Carcinoma Deaths*

Size, Cm.	0-1	1.1-2	2.1-3	3.1-4	4.1 or More	Not Stated	Total
All cases	512	177	24	12	20	84	829
	61.8%	21.3%	2.9%	1.4%	2.4%	10.1%	100.0%
Recurrences	55	24	4	3	6	10	102
	10.7%	13.6%	17%	25%	30%	11.9%	12.3%
Carcinoma deaths	2	7	4	1	7	5	27
	0.4%	4%	17%	8%	35%	6%	3.3%

TABLE 4.—*Effect of Previous Treatment*

	Number of Cases	3 Year Cures	5 Year Cures	Never Healed	Recurrences	Cutaneous Carcinoma Deaths Despite Adequate Therapy	Cutaneous Carcinoma Deaths
Previous irradiation	57	28	25	9	13	2	9
		49%	44%	16%	23%	3.5%	16%
Previous surgical intervention	41	23	21	2	5	0	2
		56%	51%	5%	12%	0%	5%
Other previous treatment	100	66	55	4	9	3	5
		66%	55%	4%	9%	3%	5%
No previous treatment	631	353	286	15	75	7	11
		55.9%	47.3%	2.4%	11.9%	1.1%	1.7%

of the first treatment at the Huntington Hospital. If a patient has two lesions and death from cancer occurs, the smaller lesion is counted as "dead of intercurrent disease, uncured."

When the formula

$$\frac{\text{cancer deaths} \times 100}{\text{5 year cures} + (\text{uncured living and dead}) + \text{cancer deaths}}$$

is used, the five year mortality is 5 per cent.

Known primary healing occurred in 89.3 per cent of all cases, or in 94.5 per cent of lesions followed for one year; these should not be considered cures, however. In spite of the large number of papers on cutaneous cancer, the standard of the five year or even three year cure is seldom used. The general practice seems to be to consider primary healing as a cure. This practice is irrational and gives misleading results. More than one fourth of the deaths from cutaneous cancer in the present series occurred after primary healing. Most writers state that from 95 to 98 per cent of cancers of the skin can be cured by irradiation and frequently do not mention their criteria of cure. Many times the percentage of cures is computed on the number of cases followed, and no mention is made of the number of cases treated. One reason for the practices mentioned is that a large number of the patients die of intercurrent disease. Cutaneous cancer

TABLE 5.—*Results of Lesions Treated 1928-1933*

Year	Living and Well	Dead of Intercurrent Disease, Cured	Living, Uncured	Dead of Intercurrent Disease, Uncured	Living Status Unknown	Dead of Cutaneous Carcinoma	Known Recurrence*	Lost	Total
0-1	661	29	23	1	8	9	51	45	829
1-2	569	57	17	2	9	13	69	92	828
2-3	520	85	11	5	8	18	73	108	828
3-4	470	119	10	5	6	20	81	117	828
4-5	433	140	7	5	4	24	86	127	826
5-6	389	161	5	6	4	26	87	134	8229
6-7	353	188	5	6	4	26	88	137	785
7-8	240	197	2	6	1	27	91	143	707
8-9	160	206	2	6	0	27	92	143	636
9-10	82	210	0	6	0	27	95	143	563
10-11	25	210	0	6	0	27	95	143	506

* Seven additional recurrences are counted only as carcinoma deaths.
† Although it has been five years since any of these patients were first treated, duration of treatment is not counted except in failures. In some, treatment was prolonged.

TABLE 6.—*Comparison with Results at Radiumhemmet*

	Huntington Hospital	Radiumhemmet
3 year cures	56.7%	74.7%
5 year cures	46.1%	55.9%
Known recurrences	12.3%	4.9%
Known dead of carcinoma	3.3%	7.6%
Metastases	0.7%	2.5%

occurs mainly in the aged, who have a short life expectancy, and does not kill rapidly.[2] There were 57 per cent of three year and 48 per cent of five year cures of all the tumors treated. If the patients lost and dead of intercurrent disease are counted as having been cured, there would be 84 per cent five year cures. If lesions not followed five years are included, there would be 76 per cent five year cures.

In order to get some approximation of the expected deaths in the series under consideration, the five year

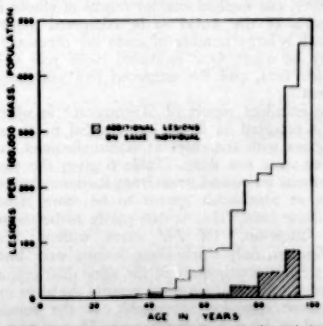

Chart 2.—Lesions treated per hundred thousand of population by age group in Massachusetts.

death expectancy by sex and quinquennial age groups was computed on the basis of deaths of the resident Massachusetts population. For the lesions under consideration there are 221 expected to end in death within a five year period, or about 25 per cent of the lesions treated should be unavailable for five year follow-up.

Magnusson's [3] method of estimating cures we do not consider reliable. He has attempted to estimate the percentage of the three year cures by applying the percentage of recurrences in patients who survive the three year period to the number of patients lost (after primary healing) and those dead of intercurrent disease before the three year period is up. After deducting the percentage of "expected" recurrences in the patients lost and dead of intercurrent disease, had they survived, he counts the remainder as cured. To these are added the three year cures of the recurrences. This method of estimation does not appear reliable. It assumes that the dead, if alive, would have behaved the same as did those who survived. This point cannot be proved.

We prefer to compute the estimated cures by expressing the known cures as percentage of the expected survivals for the population in the series. No hypothetic cures are used. Since the group is a population with cancer, the expected survival would be less than a similar group of the random population, and thus our method gives a lower estimated percentage of cures.

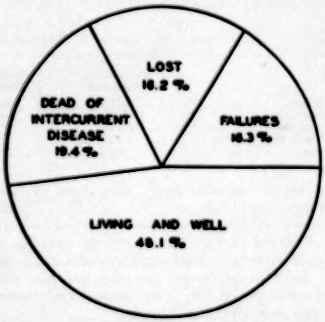

Chart 3.—Results after five years.

However, our method enables results of clinics in various parts of the world to be compared more fairly, although a large number of cases are necessary before it may be used. Our estimated three year cures are 67.4 per cent, and the estimated five year cures 65.5 per cent.

The excellent report of Magnusson [3] in which each case is reported in detail has enabled us to compare our series with the cases at Radiumhemmet in which biopsies were not done. Table 6 gives the results of the present series and those from Radiumhemmet. The results in Stockholm appear to be more satisfactory than those here. This is due partly to his more complete follow-up. Of 747 cases without histologic classification, only thirty-three lesions were lost. The sizes were approximately in the same distribution as in our series. Since Magnusson reports the sizes in areas, we cannot compare accurately. If the tumors are assumed to have a circular area, 75 per cent of the tumors treated in Stockholm were less than 2.3 cm. in diameter, whereas 83 per cent of those in our series were 2 cm. or less in diameter. One reason for the higher proportion of deaths from radium-treated carcinoma at Radiumhemmet may be that there the metastases are treated by radiation rather than by excision. Since our series includes only lesions not verified by biopsy those cases in which metastases were treated by surgical excision are automatically ruled out, and, as surgical treatment of local metastases is usually employed at the Huntington Hospital, accurate comparisons with treatment at Radiumhemmet cannot be made.

3. Magnusson, A. H. W.: Skin Cancer: A Clinical Study with Special Reference to Radium Treatment, Acta radiol., 1935, supp. 22, pp. 1-287.

COMMENT

The series of tumors considered were a quite favorable group because of the method of their selection. Surely some of the tumors treated were not malignant, for no one is always correct in one's diagnosis. The results obtained are not as good as one would expect after reading the literature on the subject. The poor results can be attributed largely to the use of surface application of radon on many of the larger lesions, allowing primary healing to take place but not killing the tumor cells which are deeply situated. The percentage of recurrences in even the smaller lesions indicates inadequate initial treatment in many cases. The results are better than those previously reported from this hospital of histologically proved cutaneous malignant growths.[1] That the better results are due to the lack of biopsy alone is probably not correct. At Radiumhemmet of histologically verified tumors 76.4 per cent resulted in three year cures and of the tumors not examined by biopsy, 74.7 per cent. The treatment was similar in the two groups. This material emphasizes the danger of even small cancers of the skin.

SUMMARY AND CONCLUSIONS

1. Of 829 treated carcinomas of the skin not verified by biopsy, 84 per cent were followed for five years.

2. There were 57 per cent three year and 48 per cent five year cures of all the tumors treated. If the cases lost and dead of intercurrent disease are counted as cures, the five year cures would be 84 per cent; if they are entirely excluded, the percentage would be 76. Recurrences occurred in 13 per cent of cases showing primary healing followed one year or more.

3. Primary healing occurred in 94 per cent of the lesions followed for one year or more. More than one fourth of the deaths from cutaneous carcinoma occurred after primary healing. Primary healing should not be considered a criterion of cure.

4. Failures are due largely to the use of very light filtered radon applied to the surface in inadequate dosage. X-rays or radium used at a distance, as is the more general practice today, would have given greater depth doses and probably have given better results.

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The Areas of Prevalence of Bubonic Plague.—From the fifteenth to seventeenth centuries, plague was with varying intensity habitually present in North Africa, Egypt, Western Arabia, Syria, Palestine, Asia Minor, Mesopotamia, Persia, probably India, China and Europe in general. From the middle of the seventeenth century, the area of prevalence began to diminish. In the eighteenth century there were only two serious outbreaks known, namely from 1703 to 1713, involving Turkey, Hungary, Austria, eastern Germany, Poland and Russia; and the second in Provence from 1720 to 1722. A hundred years later its area had shrunk to the easternmost part of Turkey in Europe and by 1841 it may be said that epidemic plague had disappeared from Europe, by 1843 it was no longer in Asia Minor, Syria or Palestine, and by 1844 had left Egypt. It has since then reappeared several times in Persia and the East but has not assumed an epidemic form to any extent.—Scott, H. Harold: A History of Tropical Medicine, Baltimore, Williams & Wilkins Company, 1939.

Clinical Notes, Suggestions and New Instruments

HODGKIN'S DISEASE AND CARCINOMA OF THE COLON: MISTAKEN DIAGNOSIS OF CARCINOMA OF THE STOMACH

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It is unfortunate when, through an initial erroneous diagnosis of carcinoma, a dramatic cure is falsely reported. When the case is used as evidence for the efficacy of a new method of treatment and thus widely publicized, the harmful result is even more far reaching. It is quoted over and over again, gradually becomes accepted as a proved fact, and gives undeserved credit to that form of therapy.

Such a case is the one reported here. On this basis alone it is worthy of publication. In addition, it shows coexistence of Hodgkin's disease and adenocarcinoma of the colon in the same patient, which in itself is unusual.

A diagnosis of inoperable carcinoma of the stomach with regional metastases to lymph nodes was first made on this patient in 1928 through abdominal exploration and microscopic examination of a lymph node removed from the gastrocolic omentum. Following this she was treated in Frankfort, Germany, by Prof. Hans Holfelder and Prof. Bernard Fischer-Wasels. Holfelder administered roentgen therapy. Fischer-Wasels, on the theory that cancer grows only in an alkaline medium, produced in the patient a state of acidosis through inhalations of a gas mixture of oxygen and carbon dioxide, plus administration of hydrochloric acid and ultraviolet rays.

The patient responded remarkably well to these treatments, with symptomatic, physical and roentgenographic disappearance of any disease in the stomach. The case was thereupon reported as an instance of apparent cure of carcinoma of the stomach.

In 1930 Professor Fischer-Wasels published an extensive report of his work on the gas treatment of cancer.[1] In this publication the case was fully presented as an instance of apparent cure of an inoperable carcinoma of the stomach by means of gas inhalation. In his visit to this country the same year he gave a lecture entitled "The Gas Treatment of Cancer" in several medical centers. This case was again quoted in full detail as an instance of apparent cure. The lecture was published in the *Wisconsin Medical Journal*.[2]

Holfelder[3] in 1931 reported the case as an inoperable carcinoma of the stomach apparently cured by roentgen therapy.

Dr. Willy Meyer gave a long, detailed and fully documented account of this case in 1932 in his paper "The Acidosis Treatment of Inoperable Malignant Tumors."[4] He said:

"The report of the case mentioned above will likely also convince many readers that the sentence . . . that 'inoperability does not necessarily mean incurability' is probably correct, and that it was the acidotic treatment, in combination with x-ray therapy, which has cured a patient who suffered from an inoperable gastric malignant tumor, the undisputed presence of which had been proven by exploratory laparotomy at the hands of an expert and by microscopical examination of a metastatic node made at a laboratory known for its reliability and exactness."

This particular case was the only one referred to in detail in the paper, and added weight was given to it by the following editorial comment: "What Dr. Meyer has to say concerning the acidosis treatment of patients afflicted with inoperable malignant tumors appears to raise justified hope for at least some of these unfortunates, although of course this new chapter of medical therapy is still in its very infancy. Until now the largest majority of these patients were universally considered doomed. We hope the article will be read and reread. It is another lead and deserves serious consideration."

At the International Congress for Prevention of Cancer held at Madrid in 1933, Holfelder[5] again presented the case as an instance of carcinoma of the stomach cured for four and one-half years. However, at this time he mentioned that a tumor of the tonsil had meanwhile developed.

In his book "Die Röntgentiefentherapie," published in 1938, he[6] quoted the case as one of inoperable carcinoma of the stomach, symptom free for nine years.

Meanwhile a tumor of the tonsil developed which was removed in 1932, and a diagnosis of Hodgkin's disease was made. Thereupon the original diagnosis on the abdominal lymph node was changed to Hodgkin's disease. Following this, the patient had repeated recurrences of enlarged nodes which responded to roentgen therapy, until she finally died in June 1939 of a general peritonitis caused by carcinoma of the hepatic flexure of the colon with perforation of the bowel wall. At autopsy Hodgkin's disease was found involving a lymph node in the right submaxillary region, but the stomach was absolutely normal.

Since the original reports of this case it has been quoted numerous times by other authors as an instance of apparent cure of an inoperable carcinoma of the stomach.[7] The latest reference to it that has been noted appeared in June 1939. In this paper[8] the case was described at length as an instance of an inoperable carcinoma of the stomach which had remained symptom free nine years. The statement was made that "this is the longest case of recovery that has been observed."

It is hoped that this report on the end result of this case may serve to rectify an error.

Following is a report of the case in detail:

REPORT OF CASE

Mrs. J. T., aged 53, began to have "heartburn" in 1928. She lost weight rapidly and became pale and weak. An x-ray examination made in June 1928 was interpreted as showing gastric ulcer. In July 1928 she began to lose her appetite and had frequent cramping in the stomach. Gastric analysis revealed no hydrochloric acid. On "internal treatment" she became worse. In August she went to Battle Creek, Mich. Here a gastric analysis revealed blood and again no hydrochloric acid. Roentgenograms of the stomach were interpreted as showing a cancer of the stomach which was considered inoperable. She had by that time lost 25 pounds (11 Kg.).

The patient desired operation and on October 24 entered the Mayo Clinic.

Examination there showed negative reports on analysis of the urine and on the Wassermann test of the blood. A blood count showed the hemoglobin content to be 58 per cent, red blood cells 3,890,000, white blood cells 10,600, differential count practically normal. Gastric analysis showed total acidity of 22 and no free hydrochloric acid. The x-ray examination revealed a carcinoma extending fairly high on the posterior wall and greater curvature of the stomach. The clinic's report of the operation was as follows:[9]

October 31 the abdominal cavity was explored by Dr. C. H. Mayo. There were many adhesions in the upper right quadrant of the abdomen secondary to an appendectomy and cholecystectomy done in 1916. The upper three fourths of the stomach, including all the posterior wall and part of the anterior wall, was involved with carcinoma; there was also involvement of the lymph nodes about the cardia just beneath the diaphragm and along the spine. A gland removed from the gastrocolic omentum for biopsy showed carcinoma. Since

From the Memorial Hospital.

1. Fischer-Wasels, Bernard: Weiterer Ausbau de Gasbehandlung bösartiger Geschwülste, Frankfurt. Ztschr. f. Path. **39**:1 48-253, 1930.
2. Fischer-Wasels, Bernard: The Gas Treatment of Cancer, Wisconsin M. J. **29**:1 131-138 (March) 1930.
3. Holfelder, Hans: Methodische Fortschritte der Röntgentherapie der Krebse des Verdauungskanals, Strahlentherapie **42**:1 497-503, 1931.
4. Meyer, Willy: The Acidosis Treatment of Inoperable Malignant Tumors, Am. J. Surg. **15**:1 112-119 (Jan.) 1932.
5. Holfelder, Hans: Die Roentgentherapie der Krebse des Verdauungskanals unter besonderer Berücksichtigung der Frankfurter Methode der topographischen Konzentration und der zeitlichen Fraktionerung, Congreso Internacional de lucha cientifica y social contra el Cancer **1**:1 789-803, 1933.
6. Holfelder, Hans: Die Rontgentiefentherapie, Leipzig, Georg Thieme, 1938, p. 265.
7. Pack, G. T.; Scharnagel, Isabel M.; Quimby, Edith H., and Leiseaux, M. C.: Palliative Irradiation of Gastric Cancer, Arch. Surg. **31**:1 851-896 (Dec.) 1935. Pack, G. T., and Scharnagel, I. M.: Palliative Irradiation of Inoperable Gastric Cancer, Am. J. Surg. **31**:1 247-257 (Feb.) 1936; Bestrahlung des inoperablen Magenkrebses, Strahlentherapie **55**:1 443-456, 1936. Merrit, E. A.: Radiation Therapy of Inoperable Intra-Abdominal Malignancy with Special Reference to the Stomach, Am. J. Roentgenol. **36**:1 324-331 (Sept.) 1936.
8. Pfahler, G. E.: Some of the Technical Radiological Advances in Gastro-Enterology with Some Comments on Roentgen Therapy in Gastro-enterology, Rev. Gastroenterol. **6**:1 160-178 (May-June) 1939.
9. Fischer-Wasels (footnotes 1 and 2). Holfelder (footnotes 3, 5 and 6). Meyer.[4]

there was no obstruction a gastro-enterostomy was not done and the abdomen was closed as an exploration.

A letter later written by Dr. C. H. Mayo to Dr. Willy Meyer, and quoted by the latter,[4] stated: "There was a tumor of the stomach which apparently involved the upper three fourths of the stomach, all the posterior wall and part of the anterior wall, with glandular involvement about the cardia just beneath the diaphragm. There was also glandular involvement along the lesser curvature and along the spine. A gland was removed from the gastrocolic omentum which apparently showed very cellular carcinoma. There was no obstruction and inasmuch as the tumor involved so much of the stomach no attempt was made to section the growth, and the wound was closed as an exploration. . . . The stomach was more like the linitis plastica type. . . . While one might be mistaken about the clinical and pathologic diagnosis, we feel quite positive that the diagnosis is correct."

The patient was discharged from the Mayo Clinic November 11. She returned to New York with the expectation of living only a few months. Meanwhile her husband had learned through the newspapers of the experimental work of Prof. Fischer-Wasels. Therefore arrangements were made for the transference of the patient to Frankfort, Germany.

She arrived in Frankfort December 9 and placed herself under the care of Professors Fischer-Wasels and Holfelder. She was "in a bad cachectic stage, with heavy convulsion pains in the upper part of the abdomen and no appetite. There was a tumor the size of a child's head, palpable in the stomach region, the palpation of which caused heavy pains."

Holfelder gave the patient high voltage roentgen therapy for about fifteen minutes once a week from Dec. 10, 1928, to Feb. 26, 1929.

Fischer-Wasels treated her by gas inhalations (pure oxygen plus 4.5 per cent carbon dioxide) for forty-five minutes three times a day. In addition she was given hydrochloric acid and acidolpepsin in increasing quantities and the whole body was treated by ultraviolet irradiation "for activation of mesenchyma and spleen."

Her condition improved rapidly. One month after the beginning of treatment the pains had disappeared, the vomiting stopped and the appetite increased. In March 1929 the tumor had shrunk to one third its former size, according to physical and x-ray examination. By May 1 the tumor could not be felt, the stomach appeared normal by x-ray examination and the patient had gained 22½ pounds (10 Kg.).

Two weeks thereafter she returned to New York and was observed by Dr. Gustav Bucky. She continued breathing the gas mixture until September 1929. She was seen by Professor Fischer-Wasels on September 19 during his visit to the United States and at that time was reported as being "in splendid health."

In February 1931 she returned to Germany and received some "prophylactic" roentgen treatments given by Professor Holfelder. She returned to New York after staying in Frankfort for eight weeks, receiving treatments two or three times a week.

October 19 she was examined by Dr. Willy Meyer and was found to be in excellent physical condition. In 1932 a tumor of the left tonsil developed which was removed October 24 by Dr. Willy Meyer at the Lenox Hill Hospital. A slide of the specimen was examined microscopically by several prominent pathologists, and a diagnosis of Hodgkin's disease was made. Dr. W. C. MacCarty, pathologist at the Mayo Clinic, believed that, in view of the patient's course and the very small specimen that he had originally the opportunity of examining, the diagnosis made on the abdominal lymph node should be changed to Hodgkin's disease.

The patient received two roentgen treatments to the neck at Lenox Hill Hospital and was then referred by Dr. Willy Meyer to Dr. Francis Carter Wood November 21. From this time she was treated at St. Luke's Hospital until January 1939. In November 1932 she received six roentgen treatments totaling 2,200 roentgens to the tonsillar region. At that time her general physical condition was good. There was no tumor in the throat or neck and x-ray films of the stomach showed no abnormality.

During 1933 she received nine roentgen treatments amounting to 3,000 roentgens, mostly over the left tonsil.

During the year 1934 she was seen frequently, felt well and had no complaints. In that year she was given one roentgen treatment over the stomach posteriorly.

April 21, 1936, a swelling of the right tonsil was noted. Roentgen treatments totaling 1,800 roentgens caused complete regression. In September she complained of vague abdominal discomfort. She was given several abdominal treatments and an additional 600 roentgens in the tonsillar region. Roentgenograms taken at this time showed the stomach to be normal in size, shape and position, with normal peristalsis.

Following this her course was uneventful until 1938, when she complained of abdominal pain. Examination revealed a palpable mass along the lower border of the stomach, and abdominal nodes could be felt. Further roentgen therapy was given. During the course of the year she received seventeen treatments of 300 roentgens each to various abdominal ports.

During the summer she gained in weight, felt somewhat better but still was not well and complained of pressure over the sternum.

Early in January 1939 she had severe abdominal pain, and the abdominal mass was found to be larger. X-ray examination of the abdomen was said to have revealed no lesion. Cholecystograms were negative. She was given three treatments of 200 roentgens each and did not reappear at St Luke's Hospital.

She then went to Boston. She was given a transfusion at the New England Sanitarium April 4 and on April 8 was admitted to the New England Deaconess Hospital under the care of Dr. Joseph Marks. At that time she was suffering from severe colicky pains in the right lower quadrant of the abdomen. Examination showed a mass extending from the costal margin almost to the level of the iliac crest. The greater part of this mass was to the right of the midline, and there was marked tenderness to pressure along the lower margin. There was no peripheral edema. There was no regional lymphadenopathy except for a soft mass in the right submaxillary region. From April 10 to April 27 she was given a course of roentgen therapy. A total of 1,100 roentgens was delivered to each of four anterior abdominal parts. The abdominal mass decreased somewhat in size. The tenderness diminished but intermittent pains continued. Six hundred roentgens was also given to the right submaxillary mass with resultant complete regression. She was again given a transfusion May 6. During her stay at the New England Deaconess Hospital her temperature varied from 99 to 100 F. May 10 she had a chill with a temperature of 104 F. The temperature then subsided to 100, where it remained until her discharge May 12. The white blood cells varied from 19,750 to 47,400; hemoglobin from 55 to 83 per cent; red blood cells from 3,260,000 to 4,270,000; the differential count showed a preponderance of polymorphonuclear leukocytes in all instances.

She returned to New York, where she remained under the care of her private physician until June 3, 1939, when she was admitted to Memorial Hospital.

On admission she complained of abdominal pain. She was emaciated, markedly pale and weak and appeared to be moribund. The right upper quadrant of the abdomen was filled by a hard, fixed, rather poorly outlined mass which extended from the costal margin to the level of the iliac crest. There was slight tenderness to pressure over the lower portion of the mass. There was marked pigmentation of the skin of the abdomen and the two upper abdominal surgical scars. There was also a small hard mass, about 2 cm. in diameter, in the right submaxillary region. The pulse was rapid and weak and the blood pressure could not be obtained. The temperature was subnormal and remained so. There was also pitting edema of the feet, legs and lower part of the back. Laboratory examination showed hemoglobin 60 per cent, red blood cells 3,180,000, white blood cells 35,000 with polymorphonuclear leukocytes 92 per cent, monocytes 3 per cent, and leukocytes 5 per cent.

Following admission the patient became rapidly weaker. She vomited frequently, and in spite of strongly supportive treatment, stimulants and transfusion she died June 7.

Postmortem examination revealed a large carcinoma of the hepatic flexure of the colon, which had caused perforation of the bowel wall. There were gangrene of the adjacent bowel wall, subdiaphragmatic and liver abscesses and generalized peritonitis. Microscopic examination showed the tumor to be an adenocarcinoma with metastases to the regional nodes.

The stomach showed no abnormality. There was no scarring of the mucosal or serosal surface, and there was no neighboring lymphadenopathy.

The only evidence of regional lymphadenopathy was in the right submaxillary region, where an enlarged lymph node was found. Microscopically this was diagnosed as reticulum cell sarcoma, but in view of the past data it was thought to be Hodgkin's disease.

Other incidental observations were thyroid adenoma, bilateral pulmonary congestion, fibrinous pleuritis with effusion, right, fatty liver, acute splenitis, chronic interstitial fibrosing pancreatitis, parenchymatous renal degeneration and arteriosclerosis.

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POISONING BY FALSE MOREL (GYROMITRA ESCULENTA)

REPORT OF A FATAL CASE

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Because of the popular interest in the use of mushrooms and other fungi as food, this case is believed to be worthy of a brief report.

Mrs. L. H., an Indian woman aged 69, ate some fungi, May 11, 1935, which proved to be false morels (Gyromitra esculenta). I saw her at 2 a. m. on the 12th. For some hours she had been vomiting and had had severe pains in the chest and the legs. There was no diarrhea. Her temperature was normal and her pulse was 72 beats a minute. The abdomen was soft and the rest of the examination was not remarkable. The vomiting and general distress continued for two days. In the evening of the 13th she had a convulsion and after that she was in coma. In the forenoon of the 15th her temperature was found to be 101.5 F. and her pulse was 120 beats a minute. Morphine sulfate was given several times to control the pain. Atropine sulfate was also given. The rest of the treatment consisted in washing the stomach, in colonic flushing and later in the use of caffeine with sodium benzoate. She died at 3 a. m. on May 16.

Several others ate of the false morels—the patient's husband aged about 80, the daughter aged 38, the son-in-law aged 61, two children aged 4 and 2 years and two young men—in unknown amounts. Of these, only the daughter suffered any ill effects. She vomited to a considerable extent but had practically recovered by the next day. The son-in-law, a white man, scoffed at the idea of poisoning, saying that he had been eating these plants "for twenty years" without any bad effects. Dr. L. E. Wehmeyer,[1] of the Botanical Department of the University of Michigan, who confirmed my determination of the species, stated that he had eaten them in the western part of this country.

This variability in toxic properties has long been recognized. Thus Dr. O. E. Fischer, in a chapter on poisoning in Kauffman's[2] work, mentions this, saying that, although this fungus is eaten by many without apparent harm, there are on record a large number of cases of poisoning, many of them fatal. Patterson and Charles[3] do not class it as edible for the foregoing reason. On the other hand, Marshall[4] in a popular book not only calls these fungi edible but gives special directions for preparing them, which include boiling for fifteen minutes followed by two rinsings in boiling water. Fischer[2] states that the poison is very soluble in hot water, so that parboiling the fungi and rinsing them may render them safe. According to Dr. Wehmeyer,[1] it has been thought that cooking with vinegar might render the poison innocuous. In the instance reported here, they were fried after having been parboiled, but how thoroughly rinsing was done is unknown.

The plant is called also the lorchel and bears the synonym Helvella esculenta. It consists of a bay-red cap 2 inches (5 cm.) or more in width attached in several places to a lighter colored stem of about the same length. The cap is irregular in form, scarcely any two specimens being alike, and is lacking in symmetry. The general form reminds one of a mass of dough which has overrisen and has flowed out of its container. The surface is covered with folds which may well be likened to the convolutions of the brain. The "true" morels (Morchella sp.), on the other hand, are buff yellow to brown or darker, and the caps are more or less uniform, being conical or ovoid, while their surfaces have a more spongy appearance. Actual confusion between these kinds can hardly occur and, paradoxically, the principal danger seems to be that a considerable number of persons have eaten the false morel with impunity. The specific name esculenta, which is Latin for edible, is certainly misleading.

Reports of poisoning by "mushrooms" are seen in the daily press from time to time. Of those occurring in the spring of the year, at least in the Northern states, it is quite likely that some are due to the false morel. It is highly desirable that all such cases be investigated botanically.

SUMMARY

Of several persons who ate false morels (Gyromitra esculenta), two became ill with vomiting and one died after a convulsion followed by coma. The toxic properties of this plant are variable, but its consumption should be regarded as unsafe.

1. Wehmeyer, L. E.: Personal communication to the author.
2. Fischer, O. E.: Mushroom Poisoning, in Kauffman, C. H.: The Agaricaceae of Michigan, Publication 26, Biology Series 5, Michigan Geological and Biological Survey, 1918.
3. Patterson, Flora W., and Charles, Vera K.: Mushrooms and Other Common Fungi, Bulletin 175, United States Department of Agriculture, April 1913.
4. Marshall, Nina L.: The Mushroom Book, New York, Doubleday, Page & Co., 1913.

CHANGES IN THE ELECTRO-ENCEPHALOGRAM FROM LIGATION OF THE CAROTID ARTERIES

IN THE CASE OF INTRACRANIAL SACCULAR ANEURYSM

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The electro-encephalogram is becoming recognized as a sensitive indicator of the status of the cerebral cortex. The most prominent feature characterizing the normal electro-encephalogram is the alpha rhythm, which has a frequency averaging about ten cycles per second. When the function of the cerebral cortex is suppressed, regardless of the cause, the associated electrical potentials become less rhythmic and are irregular in shape and amplitude, and the frequency decreases and becomes irregular, ranging from one to seven cycles per second. This random slow frequency was termed by Walter[1] the "delta" wave. It may be confined to a local region in the vicinity of a tumor or it may be generalized as a result of some diffuse brain involvement.

The present discussion concerns the study of the electro-encephalographic records in the case of ligation of the large vessels of the neck as a therapeutic measure for an intracranial saccular aneurysm. The diagnosis and surgical treatment was reported by one of us (Walsh) and Drs. Horton and Adson[2] at a staff meeting of the Mayo Clinic. We shall deal here only with the electro-encephalographic observations.

Other investigators[3] ligated cerebral vessels in animals and observed various degrees of suppression of the function of the cerebral cortex. To our knowledge there has been no previous report on similar observations in man.

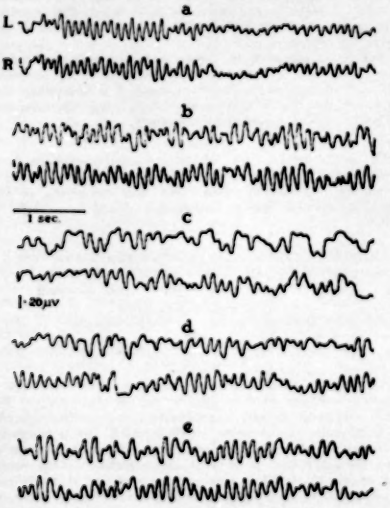
REPORT OF CASE

A white woman aged 34, a registered nurse, began to have left-sided headaches in 1917, at the age of 12 years. In 1930,

1. Walter, W. G.: The Location of Cerebral Tumors by Electro-Encephalography, Lancet **2**:305-308 (Aug. 8) 1936.
2. Walsh, M. N.; Horton, B. T., and Adson, A. W.: Diagnosis and Surgical Treatment of Intracranial Saccular Aneurysm, Proc. Staff Meet., Mayo Clin., to be published.
3. Bartley, S. H., and Bishop, G. H.: Cortical Response to Stimulation of the Optic Nerve, Proc. Soc. Exper. Biol. & Med. **29**:775-777 (March) 1932. Simpson, H. N., and Derbyshire, A. J.: Electrical Activity of the Motor Cortex During Cerebral Anemia, Am. J. Physiol. **109**:99 (July) 1934. Bremer, F., and Thomas, J.: Action de l'anoxémie, de l'hypercapnie et de l'atropine sur l'activité électrique du cortex cérébral, Compt. rend. Soc. de biol. **123**:1256-1261, 1936.

during a headache, she complained of difficulty in speaking. In February 1935 she suddenly experienced a severe pain in the left side of the head with the onset of rigidity of the neck and then consciousness was lost. Six days later a right hemiparesis appeared. A spinal puncture was performed at this time; the cerebrospinal fluid was very bloody. The patient remained unconscious for four weeks. On recovering consciousness, she was found to have considerable aphasia and agraphia. The right hemiparesis persisted for five weeks. The aphasia has subsequently gradually improved. Since this episode headaches have occurred about four times weekly.

The patient first came to the Mayo Clinic Oct. 10, 1938. The results of the general medical examination were essentially negative. The neurologic examination revealed a slight motor type of aphasia with some exaggeration in the tendon reflexes of the right arm and leg and diminution of speed



Electro-encephalograms of a patient with intracranial saccular aneurysm before and after ligation of the left carotid arteries. Upper tracing, left parietal-occipital; lower tracing, right parietal-occipital; *a*, taken Feb. 27, 1939; *b*, taken August 3, six days before operation; *c*, August 12, three days after operation; *d*, August 15, six days after operation; *e*, August 18, nine days after operation.

in the right hand. The patient also complained of a swishing bruit, synchronous with the pulse, in the left side of the head.

The patient returned to the clinic Feb. 25, 1939, with a history that one week before she had experienced a sudden severe pain in the left side of the head which had persisted in increasing severity for three days. At the end of that time increased weakness of the right arm, increased difficulty in speech and some neck rigidity had occurred. Three days later the strength in the right arm had improved and the speech was better.

On examination at the clinic a significant difference from the previous examination could not be noted. Pressure on the right internal carotid artery could not be made for longer than three minutes without increasing the pain in the head. The impression was that of a saccular aneurysm either of the anterior part of the circle of Willis on the left or near the junction of the left internal carotid with the circle of Willis. The electro-encephalogram taken during this observation period was normal. The alpha rhythm was similar on the two sides of the head (tracing *a*). The patient was advised to make digital pressure on the left carotid artery, beginning with five minutes three times daily and gradually increasing until she could tolerate forty-five minutes of carotid compression.

July 26, 1939, the patient returned to the clinic stating that the pain in the left side of her head had increased to such an extent that it made her life miserable. The results of the neurologic examination were essentially the same. Pressure on the left carotid artery produced complete relief of the headaches and carotid compression could be maintained for forty-five minutes.

Electro-encephalographic tracings taken August 3 had changed slightly from the previous ones (tracing *b*). The alpha rhythm was somewhat less regular on the left as compared to the right. The average frequency on the left was about eight cycles per second, whereas on the right it was near ten. Some delta activity was now present. The slight abnormality of the electro-encephalogram from the left side of the head might be explained on the basis of a mild suppression of the function of the cerebral cortex as a result of the repeated compressions of the internal carotid artery which bring about a transitory anemia of the left hemisphere. One would like to know whether the previous episodes of aphasia might have shown changes had electro-encephalograms been taken at the time.

August 9, on the advice of one of us (Walsh) and Dr. Horton, Dr. Adson ligated the left common, internal and external carotid arteries. The patient's convalescence was satisfactory following the operation and she has had no pain whatever since that time.

Three days after operation a third electro-encephalographic record was made and a marked change was noted (tracing *c*). The alpha frequency on the left was reduced considerably over the entire hemisphere and it was replaced by the slow, irregular, random delta waves which had a frequency of 1.5 to six cycles per second. The alpha rhythm from the right hemisphere was not appreciably affected though a few delta waves were present. This is suggestive of a suppression of the function of the cerebral cortex and in this case is undoubtedly associated with the diminution in blood supply of the left cerebral hemisphere as a result of carotid ligation. One other feature of the electro-encephalogram was noted. Throughout the record there was a very slow wave of one cycle in two to three seconds which apparently arose from all the areas of the cerebrum. This type of wave has been noted in conditions in which an acute impairment of the activity of the brain was present. It has been observed in the last stages of neoplastic growths in which the lesion has proved to be extensive and has caused considerable increase of the intracranial pressure. However, no localizing value has been attached to the presence of this wave. In the present case the only significance associated with it is the suggestion that the ligation of the vessels has produced an acute condition within the cerebrum.

Two more recordings were made six and nine days after operation (tracings *d* and *e*). The first showed considerable improvement of the electro-encephalogram. The delta activity had diminished noticeably on the left side with a subsequent return of the alpha rhythm. The very slow wave had vanished. However, there was still some discrepancy between the two hemispheres. Delta waves were still slightly more abundant on the left and the alpha rhythm averaged about two cycles per second less than on the right. The last recording showed still further improvement, but the similarity of the two sides had not yet returned to that of the first recording.

COMMENT

The question has frequently arisen Does the decrease of cerebral circulation resulting from ligation of one common carotid artery in the neck produce irreversible damage to the brain? The observations would suggest the contrary. Not only were the abnormal changes in this case transitory but also a return to the normal state was rather rapid, a condition which is indeed encouraging. It is to be expected, however, that more severe and permanent damage to the brain will result when the collateral circulation through the circle of Willis is inadequate. This emphasizes the necessity for careful study by means of digital compression of the carotid artery to determine as well as possible the adequacy of the collateral circulation through the circle of Willis before undertaking ligation of the carotid artery.

POTASSIUM SALTS IN HAY FEVER

HYMAN MILLER, M.D., AND GEORGE PINESS, M.D., LOS ANGELES

In December 1938 Bloom [1] reported marked success in the treatment of hay fever by the oral administration of potassium salts. Reporting twenty-nine cases of hay fever, Bloom stated that the administration of 5 grains (0.32 Gm.) of potassium chloride three or four times a day in a glass of water gave in all twenty-nine "a degree of relief which was estimated as over 50 per cent, and in most of them approximately 100 per cent." A second report confirming these results was published by Bloom and Grauman [2] in July 1939. Meanwhile Abt [3] reported comparable results in children and Engelsher [4] in a communication to THE JOURNAL reported practically complete failure.

In view of the simplicity of the treatment involved and the importance of hay fever as a disabling affliction, it was thought advisable to repeat the work of Bloom. The following account, therefore, presents our efforts impartially to evaluate the results of the treatment of hay fever patients with potassium salts administered according to his method. The patients so treated gave histories characteristic of hay fever, and the appearance of the mucous membranes of their eyes, noses and throats was consistent with that diagnosis. In addition, all gave positive cutaneous reactions to several substances known to produce hay fever, all showed eosinophils in their nasal smears, and many showed an increased eosinophil count in the blood. These patients differed from the other hay fever patients treated during the same period only in that specific treatment based on the results of cutaneous testing had not given satisfactory relief of symptoms.

The patients treated with potassium salts may be divided into two groups. The first group was treated during January 1939, at a time when there was practically no pollen in the air in this vicinity. The second group was treated in the period from June to November 1939, when there was considerable pollen in the air, thus abiding by the rule that the evaluation of any treatment of hay fever should not be made at a time when the causative factors may naturally disappear from the environment and thus give spontaneous relief.

Adhering to the dosage recommended by Bloom, a solution was prepared containing 5⅛₀ grains (0.33 Gm.) of potassium chloride to the teaspoonful. This solution was colored and flavored with a palatable orange syrup and marked solution A. A second solution containing 4 grains (0.26 Gm.) of sodium chloride (equimolal to the potassium chloride solution) similarly colored and flavored was marked solution B. The contents of each group of bottles remained unknown to ourselves and to the patients from the beginning of the experiment to its end. These were the only solutions given to the patients in the first group; that is, to those treated during January 1939. In this group there were nine patients. Each took at least 4 ounces (120 cc.) of solution A, followed on the next week by a similar amount of solution B, in doses of one teaspoonful in a glass of water three or four times a day. Not one patient reported relief from either solution.

After personal consultation with Dr. Bloom it was discovered that at times he had found it necessary to give a larger dose of potassium chloride. It was decided to duplicate his methods as exactly as possible. Therefore a third solution was prepared containing 10 grains (0.65 Gm.) of potassium chloride to the teaspoonful, which was bottled and labeled solution C. As further controls a solution of potassium bicarbonate 1.3⅗₀ grains (0.9 Gm.) to the teaspoonful, labeled solution D, and a solution of sodium chloride 8 grains (0.5 Gm.), plus quinine ³⁄₁₀₀ grain (1.3 mg.) to make a flavor similar to that of solution C was prepared and labeled solution E. Solutions C, D and E were otherwise not sweetened or flavored. Solution C was dispensed in the same manner as had been solutions A and B, but over the period from August to October 1939, to thirty-one patients with hay fever symptoms which had not responded to the usual treatment. The results may be summarized as follows: One patient reported that headaches accompanying coryza and nasal obstruction were relieved by solution C, but on the administration of solutions D and E the same report was obtained. One patient reported complete relief from solution C and solution D and also from solution E. No other patient obtained relief from any of the solutions. Only two patients asked for more of the solutions, namely the two just mentioned, who reported relief regardless of which solution was administered. One patient who had not obtained relief became discouraged, left our care, visited another physician who gave him potassium chloride, and reported back triumphantly that he had been relieved by the "new medicine," being unaware that he had already received potassium chloride at our hands without relief.

In passing it may be noted that several patients with urticaria and migraine treated with potassium chloride reported no relief and that several patients with bronchial asthma reported no aggravation of symptoms on taking the salt.

SUMMARY

The administration of potassium chloride according to the method of Bloom gave no relief to thirty-eight of forty hay fever patients, the remaining two patients obtaining as good relief from placebos.

672 South Westlake Avenue.

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2. Bloom, Benson, and Grauman, S. J.: Potassium in Allergy, Southwest Med. 23:205 (July) 1939.
3. Abt, A. F.: Note on Oral Administration of Potassium Chloride in the Treatment of Hay Fever, Nasal Allergy, Asthma and Sinusitis, Am. J. M. Sc. 198:229 (Aug.) 1939.
4. Engelsher, D. L.: Potassium Chloride in Allergy, J. A. M. A. 113:961 (Sept. 2) 1939.

Special Article

THE PHARMACOPEIA AND THE PHYSICIAN

THE THERAPY OF PRURITUS

ARTHUR W. STILLIANS, M.D.

CHICAGO

This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Technically, pruritus means itching without cutaneous manifestations of disease, but this article will hold to the wider use of the word as synonymous with itching, regardless of the presence or absence of visible alterations in the skin. Itching is so common a sensation as to be considered physiologic. Each one of us itches frequently and by the commonest of reflexes scratches or rubs, consciously or unconsciously. Slight itching is thereby allayed. Only when the sensation is not thus allayed but persists and becomes annoying is it considered pathologic. Little is known of its pathogenesis. The neurologists tell us that itching is a subpain sensation, a milder impulse traveling over the nerve pathway that transmits pain. The impulse must originate in the epidermis, however, for deeper irritations do not cause it and itching does not occur after the epidermis is removed. Whether itching is caused by any particular subpain impulse depends on the threshold of susceptibility, under the control of the vegatative nervous system, in turn influenced by the metabolism of cutaneous cells and nerve endings, the complex of endocrine products and the mental state of the patient. A strong initial impulse, less than sufficient to cause pain, may, with a high threshold

against irritation, cause little itching, while a slighter impulse with a low threshold may result in much distress.

Many years ago Kaposi explained the importance of scratching as a means of perpetuating and intensifying itching. Instead of being allayed by scratching, the itching soon returns with greater intensity, the patient responds with more vigorous scratching and this in turn increases the itching. Sulzberger and Wolf [1] in a recent article add to this illustration the presence in the blood of a toxin causing the itching, which, by the increase of circulation resulting from the scratching, is brought to the skin in greater amount and adds to the vicious circle, which must be broken if the distress is to be allayed. Fortunately, a break in any part of the circle, as in an electric circuit, may stop the current. If the cause can be removed, the cellular metabolism altered or the threshold raised in any other way, the itching may cease.

Discovery and removal of the cause is the first principle of treatment. This may take time. Even after the discovery of the cause, removal may be difficult or impossible—it may be a carcinoma of the liver, for instance—and something must be done to relieve distress. After the cause has been removed, as in scabies, the itching may continue because the "skin memory," so named by Jacquet, has lowered the threshold of susceptibility, and itching results from slight irritations not noticed by normal skin. This skin memory tends to continue itching in every case of pruritus after the real cause of the attack has ceased to act.

As may be inferred from the frequency of its occurrence, pruritus is caused in innumerable ways. The list that follows is incomplete, no doubt, and a number of these conditions may interact, so that the possibilities run into astronomical figures.

ETIOLOGY

Local Causes.—1. Animal parasites, such as the itch mites and other insects that live on the skin, the hairs of certain caterpillars, the bites of insects, the sting of jelly fish and other aquatic animals, pinworms and Trichomonas.

2. Vegetable irritants such as itch powder, nettles, which are directly irritant, and the myriad other vegetable substances—fungi, plant juices, woods, pollen, and drugs—which become irritants after the patient's skin becomes sensitized to them.

3. Mechanical irritants such as scratching and rubbing, the rubbing of clothing and the effect of wind.

4. Thermal irritants; cold more commonly than heat, yet cooling is one of the chief aids in alleviation of itching, lessening local congestion and substituting the sensation of coolness for that of itching. This is another illustration of the complexity of the problem. Whether the abnormal reaction to cold or heat is due to a real allergy or to a form of overactivity of the vegetative nervous system is still being debated.

5. Chemical irritants. Simple chemicals, mercurials, sulfur and nickel may be guilty when the skin is sensitized. Of course the causes listed under 1, 2, 6 and 8 and possibly 7 and 9 are basically chemical irritants.

6. Local secretions. Sweat left in the folds of the skin, where it degenerates, alkaline or too acid urine, diabetic urine, that containing calcium or oxalate crystals, vaginal discharges, preputial secretion and fecal discharges often cause itching. Urethritis, cystitis and endometritis act partly at least in this way.

7. Actinic action. This depends on the degree of reaction. There may be no itching until scaling occurs and the skin relaxes.

8. Retention in the skin of abnormal products of metabolism, as the nitrogen retention demonstrated by Urbach in kidney disease.

9. Disease. Lymphoblastomas, Hodgkin's disease, leukemia and granuloma fungoides act partly by abnormal local growths, partly by toxin formation.

General Causes.—1. Reflex irritations, such as lymphoblastomas and other tumors, by pressure on the viscera. It may be that the itching due to colitis, constipation and endometritis is partly due to reflex nerve irritation.

2. Deficient nutrition, anemia and vitamin deficiencies.

3. Toxemia, such as liver disease, especially obstructive jaundice, cholecystitis without jaundice, cirrhosis, carcinoma; gastrointestinal disease, constipation and pregnancy.

4. Endocrine disturbances, such as diabetes, exophthalmic goiter and the menopause.

5. Sensitization to bacterial toxins, as in focal infections, to fungi and to foods, drugs, inhalants and innumerable external contacts.

6. Foods and drugs that exert a direct effect. Alcohol increases cutaneous circulation, caffeine increases sensory receptivity; the patient becomes conscious of itching. Morphine and related drugs cause itching in some way not well understood.

7. Dermatoses of unknown or little understood origin, lichen planus, eczemas, dermatitis herpetiformis, lichen urticatus, urticaria.

8. Nervous disease: organic, as tabes, dementia paralytica; functional, as hysteria, masturbation, fear or other mental disturbance, autosuggestion or heterosuggestion.

TREATMENT

If the cause can be removed, well and good, but this is not cure. Skin memory may maintain considerable pruritus and other causes may have entered during the period of treatment, as in the treatment of scabies, when the patient, to allay the itching persisting by skin memory after the death of the mites, applies the sulfur ointment again and acquires a sulfur dermatitis. If there is delay in removing the cause, the attempt to break the circuit at some other point must be made.

Suppression of scratching and rubbing is of great importance, perhaps next to the effort to remove the cause of the disorder. Our duty in this effort to suppress scratching does not end when we tell the adult patient to stop it or put a splint on the baby's arm. Soothing applications must be used to lessen the itching and the urge to scratch. The adult is thus given something to do to supplant his too steady occupation with scratching. The explanation of the evil effect of rubbing and scratching helps him to restrain himself.

Cooling the skin, whether or not visible congestion is present, is one of the most efficacious and promptest

PRESCRIPTION 1.—*Dusting Powder*

		Gm.
℞	Boric acid	12
	Talcum	
	Zinc stearate ..... āā To make	120

1. Sulzberger, M. B., and Wolf, Jack: Pruritus and Its Treatment, M. Clin. North America **19**:971 (Nov.) 1935.

means of relief. Cool wet compresses of saturated boric acid solution, thin and not covered, and changed whenever the compress becomes warm, are the simplest form. The nurse can apply them while waiting for the doctor with no danger of harm. If oozing is present, from 6 to 10 per cent aluminum subacetate solution may be more helpful because it is astringent. When there is no accompanying inflammation of the skin, hot water, as hot as can be borne, is sometimes efficacious for limited areas, and the effect can be increased by the addition of sodium bicarbonate up to saturation. After a session of cool wet dressings or of hot water, the skin should not be dried but the water allowed to evaporate and the part powdered with talcum, which continues the cooling process.

PRESCRIPTION 2.—*Evaporating Lotion*

		Gm. or Cc.
℞	Salicylic acid	0.45
	Alcohol, 50 per cent	90.00

Evaporating lotions are another form of cooling preparations. They can be used whenever the surface is not broken and are especially useful in the axillae and under the breast but are too apt to be irritating about the genitalia and anus.

Prescription 2 is antiseptic and fungistatic as well as cooling and antipruritic. It is especially useful for the itching of miliaria.

PRESCRIPTION 3.—*Calamine Lotion*

		Gm. or Cc.
℞	Calamine Zinc oxide ..... āā Lime water ..... To make	8 120

Calamine lotion is perhaps the most widely used preparation to relieve itching.

If this is to be used on unbroken skin, equal parts of lime water and rose water make it less liable to cake and somewhat less drying. If the skin is too dry to accept this, glycerin may be added or calamine liniment may be used.

PRESCRIPTION 4.—*Calamine Liniment*

		Gm. or Cc.
℞	Calamine Zinc oxide ..... āā Lime water Olive oil ..... āā	8 60

Rose water ointment is a good cooling agent for skins that need oil. Ten per cent boric acid powder makes it more soothing. Menthol has a cooling effect after the first slight stinging sensation. It should seldom be

PRESCRIPTION 5.—*Menthol and Rose Water Ointment*

		Gm. or Cc.
℞	Menthol	0.15
	Boric acid	3.0
	Rose water ointment ..... To make	30.0

used in strong concentration, for it may irritate. From 0.25 to 0.5 per cent is often sufficient. It must not be used over a large surface in older patients because of the danger of chilling, and of course it should not be used close to the eyes. Not only do these applications give the patient a substitute for his preoccupation with scratching but the cooling sensation acts as a substitute for the itching sensation.

The cooling effect of menthol and of rose water ointment may be combined as in prescription 5.

Zinc paste is a good preparation for skins that cannot stand soft ointments yet are uncomfortably dry when calamine lotion is used. For those who need a little more softening, zinc oxide ointment, containing only 20 per cent of powder, is better. Such ointments are to be applied very thinly when drying and cooling are desired, thickly when it is advisable to protect from the air and to macerate. The patient should always be instructed to use oil for the removal of the ointment, if this must be done, and to be as gentle as possible. It is better to leave a little of the ointment or paste than to employ any rubbing. The temptation to do a thorough job as an excuse for getting in a good rub is great.

In hairy areas in the folds of the body soft zinc paste may do better work. This hardens if left longer than

PRESCRIPTION 6.—*Soft Zinc Paste*

		Gm. or Cc.
℞	Zinc oxide Calcium carbonate ..... āā Lime water Olive oil ..... āā	6 9

twelve hours, so that it must be removed and replaced. Tar, phenol, menthol or resorcinol may be added but not salicylic or benzoic acid, which may break the emulsion.

Protection from the air may be given by films such as tragacanth lotion. Applied in a thin layer, this dries quickly and leaves a thin film.

PRESCRIPTION 7.—*Tragacanth Lotion*

		Gm. or Cc.
℞	Tragacanth	5
	Glycerin	2
	Water ..... To make	100

Still greater protection is obtained with Unna zinc oxide jelly. This must be melted over a water bath and painted on while warm. It cools in an hour or less to a pliable, smooth covering that can be removed with

PRESCRIPTION 8.—*Unna Zinc Oxide Jelly*

		Gm. or Cc.
℞	Zinc oxide	10
	Gelatin	30
	Glycerin	30
	Water	30

water. On very moist surfaces it is difficult to use. Alternate layers of the jelly and thin layers of cotton or gauze may be used to make the glove or legging sufficiently strong.

Antipruritics may be added to any of these preparations. Both by experience and by experiment phenol has been found the most useful. It must not be used in too great strength, for as little as 1.5 per cent in wet dressings has been credited with causing gangrene. In watery lotions 0.5 per cent, dissolved by the aid of glycerin, is usually sufficient. It is necessary to use a stronger percentage in alcohol or oil because the effect is much less than in water. One per cent is usual. The

danger of ill effects is also less. Combined with camphor, as camphor phenol, any strength, even undiluted, is allowable.

Resorcinol is also a useful antipruritic but cannot be used in acute dermatitis because it is irritating. In chronic forms of dermatitis it acts also as a reducing agent. A 2 per cent lotion in alcohol is often very effective for noninflammatory itching. Ethyl aminobenzoate and orthoform are not very effective on unbroken skin and are apt to irritate. The same is true of procaine hydrochloride, cocaine, butyn and the like. Salicylic acid and mercury bichloride are mildly antipruritic. Sulfur is antipruritic also and is especially useful in cases of dermatitis herpetiformis in lotion.

Prescription 9.—*Sulfur Lotion*

		Gm. or Cc.
℞	Sulfurated potash	12
	Water ..... To make	120

It has the same limitation that has been mentioned in reference to resorcinol: it is irritating and must not be used in acute dermatitis. Indeed, the irritating action of sulfur causes in part the continuance of itching after the cure of scabies, producing a dry, very itchy dermatitis.

Tars are among the most popular of antipruritic agents. The wood tars: birch tar or juniper tar may be added to ointments or lotions up to 15 per cent, and coal tar from 6 per cent up. The solution of coal tar is a useful preparation, used in various dilutions up to 100 per cent. All the tars are stimulating and must be used with caution in dermatitis. It is a good plan to try out the tar preparation on a small part of the inflamed area before applying it to the whole tract. Continued too long, tars often cause folliculitis, and they must then be discontinued.

Prescription 10 is very popular.

Prescription 10.—*Crude Coal Tar Ointment*

		Gm.
℞	Crude coal tar	
	Zinc oxide ..... Of each	2
	Petrolatum ..... To make	30

Applied in a thin coat this is antipruritic, drying and very effective in many subacute or chronic forms of dermatitis. Coal tar is much less apt to irritate than the other tars. The ointment should be renewed at least once a day, after removal with oil. If the clothing is stained with it, soaking the fabric in oil or kerosene for several hours will permit washing out of the stain. If more body to the ointment is desired, the amount of powder may be increased.

Although wet dressings locally applied are usually most effective when kept cold, because the cool skin with its lessened blood supply has a lessened receptivity for the irritating impulses, it is obviously impossible to use this aid in applying the full bath, which must be not stimulating, as are hot or cold baths, but in order to be soothing must be tepid, about body temperature. As Sulzberger and Wolf [3] point out, the bath is a much safer weapon against pruritus in the hands of unskilled nurses than are ointments and pastes. Although this is true, for there are many ways of making ointments or pastes irritating instead of soothing, the bath too requires the use of that form of mental action called common sense. It is best when it can be prolonged. This is perfectly safe for most patients, but under certain conditions the patient requires close watching on the part of the attendant. Under all circumstances care must be used to avoid drafts and to keep the temperature of the bath and that of the room even. When one emerges from the bath, if the skin is inclined to be too dry, it should be dabbed partly dry and an oily lotion or salve applied gently. The strict rule that the drying must be done by the nurse, not by the patient, will guard against the temptation to rub with the towel and set up the itching again. The underclothing or pajamas must be of the softest possible material and not too warm, for overheating is to be carefully avoided. If woolen underwear is thought necessary, soft cotton or silk should be worn under it. Some, even dry, skins get more comfort from a dusting powder generously applied than from oily preparations. The powder is cooling and protects against the friction of clothing. Baths should be taken in the daytime, not just before retiring. Starch, bran or oatmeal baths may be more soothing than with plain water.

To increase their antipruritic effect, baths may be medicated with tar, for instance, with the solution of coal tar or a strong solution of sulfurated potash. A much more economical use of such medicaments, however, is their application as a lotion after the bath. One per cent of saponated cresol solution in water, 10 per cent or more of solution of coal tar or calamine lotion or liniment may be used. In other cases, ointments or pastes may be more appropriate.

The internal treatment of pruritus is aimed at elevating the threshold of irritability. This may be accomplished by:

1. Reducing nerve irritability by general sedatives.
2. Restoring the balance in the vegetative nervous system.
3. Reducing irritability of the local cutaneous cells.

To this end it is of great importance that the patient have rest so that the strength needed for cure may not be dissipated by the muscular or mental activities that occupy the itching patient. A quiet room and a skilful nurse are invaluable aids to all three of these objectives. Soothing medication is of great importance. The itching patient should not be allowed to lose sleep, for that increases his irritability. The diet must be bland, with no condiments, alcohol, tea, coffee or coca cola. Tobacco should be restricted as much as possible. Among the many drugs available, the salicylates deserve first mention because of the ease of administration as well as their effective performance. They lessen nerve irritability, relax the skin and stimulate perspiration.

Prescription 11.—*Capsules of Phenobarbital and Acetylsalicylic Acid*

		Gm.
℞	Phenobarbital	0.5
	Acetylsalicylic acid	5.0

Mix and divide into fifteen capsules.
Label: One capsule at bedtime as needed.

Acetylsalicylic acid, the most active of this group, can be combined with hypnotics in small doses, such as in prescription 11.

Although phenobarbital is listed as one of the drugs sometimes causing itching, this does not occur from the small dosage recommended in this prescription except in rare instances of great sensitization.

The most useful drug for general use as a nerve depressant is a bromide. It also is guilty at times of causing a peculiar dermatitis, but this is rare and occurs only after long continued use in large doses, excepting in those predisposed to acne. It may be given by mouth (prescription 12).

If the gastrointestinal tract refuses to tolerate the drug, the sodium salt in 1 per cent solution can be given intravenously once every day or less often as needed. During the use of bromides the patient should be seen frequently, and as the effect of the drug is attained the dosage can be reduced to just enough to maintain the required effect.

PRESCRIPTION 12.—*Sodium Bromide Solution*

		Gm. or Cc.
℞	Sodium bromide	22
	Peppermint water	90

Mix and label: A teaspoonful after each meal and on retiring.

Attempts to restore the balance of the vegetative nervous system may be made by drugs acting directly on that part of the nervous system, atropine or epinephrine in the vagotonic and pilocarpine or physostigmine in the sympathicotonic.

Ergotamine tartrate is too dangerous a drug for this purpose.[2]

No two patients are alike in their response to medication directed at the sympathetic nervous system. The patient should be under close watch and the physician need not be ashamed if several different methods have to be tried before success is achieved.

Bleeding is perhaps the simplest of the indirect methods of attacking this problem, reducing the blood pressure, the amount of blood in the skin and the amount of toxin acting on the nerve endings. It may be supplemented by intravenous injection of physiologic solution of sodium chloride or Ringer's solution to obtain an effect of washing the blood. This is especially indicated in the pruritus of uremia.

Injection of the patient's own blood into the gluteal muscles is often successful. From 5 to 20 cc. of blood is usually employed once every five days. Normal serum may be injected intramuscularly or sterilized milk, turpentine in small amount, hypertonic salt or sugar solution. Sodium thiosulfate solution, given intravenously, has been employed to influence the vegetative nervous system in various other dermatoses and in pruritus. It can be given in doses of from 0.3 to 0.1 Gm. in 10 cc. of water every day or every other day. Artificially induced fever has benefited some itching dermatoses. This and the use of vigorous foreign protein therapy such as vaccine intravenously are last resort measures and must be used with the utmost caution in any case in which there is a suspicion of sensitization.

Ultraviolet rays are supposed to have an influence on the vegetative nervous system as well as on the nerve endings in the skin. In suberythema doses they are sometimes very helpful, particularly in the itching of lichen planus, diabetes, pregnancy, anogenital pruritus, neurodermatitis, chronic eczema and the lymphoblastomas.

2. Yater, W. M., and Cahill, J. A.: Bilateral Gangrene of the Feet Due to Ergotamine Tartrate, Used for Pruritus of Jaundice, J. A. M. A. **106**:1625 (May 9) 1936. Gould, S. E.; Price, A. E., and Ginsberg, H. I.: Gangrene and Death Following Ergotamine Tartrate Therapy, ibid., p. 1630.

The method of Gouin and Bienvenue of applying roentgen rays to the spinal region is supposed to act by influencing the sympathetic nervous system. Roentgen rays locally are a valuable means of controlling itching. They are said to act on the nerve endings in the skin, reducing their sensitivity and, if any inflammatory infiltrate is present, cause its resolution. Lymphoblastomatous infiltrates are destroyed by them until, from repeated exposure to the rays, they acquire a resistance and cease to yield. Sometimes a very small dose will stop the itching—one eighth erythema dose (43 roentgens). Other cases, apparently similar, may require more. The limitation of roentgen dosage, because of the danger of damaging the skin, causes trouble at times, for it is difficult to convince some patients that the refusal to give more x-rays is final, and they sometimes go to another physician and deceive him in order to get the relief that they know roentgen rays will give.

Grenz rays, which are very soft roentgen rays, can be applied only to smaller areas and are less apt to damage the skin, but they are not wholly harmless. On the scrotum Grenz rays or radium plaques are much more easily used than ordinary roentgen rays without the danger of causing azoospermia.

Because of their action in reducing cell permeability, calcium compounds are much used. Part of their action may be due to their effect on the liver. The same may be true of hypertonic dextrose solution given intravenously.

The alkaline diuretics can be given in acute dermatitis with good effect, as in prescription 13.

PRESCRIPTION 13.—*Alkaline Diuretic*

		Gm. or Cc.
℞	Potassium acetate	7
	Sodium citrate	22
	Peppermint water	To make 90

Mix and Label: Four cc. three times a day after meals, with a full glass of water.

Epinephrine is not the only endocrine substance useful in combating pruritus. Insulin, even when there is no hyperglycemia, has proved useful in small doses, up to 20 units, in certain cases.[3]

Ephedrine is of use at times, acting like epinephrine to constrict blood vessels and lessen circulation.

In some cases the opposite action, dilation of blood vessels and lowering of pressure, relieves otherwise intractable pruritus. A tablet of glyceryl trinitrate 0.6 mg. (1/100 grain) dissolved under the tongue may in a few minutes cause the itching to cease for an hour or two. The effect of diluted erythrityl tetranitrate 0.03 Gm. (one half grain) lasts longer—sometimes six hours—but also is slower in appearing, about thirty minutes. If the itching is not relieved when the skin flushes and the head feels full, the drug has failed. If, after its successful use for several days the drug loses its effect, cessation of use for a few days will usually restore effectiveness.

TREATMENT FOR SPECIFIC FORMS OF PRURITUS

Anogenital Pruritus.—A large percentage of the commonest form of pruritus—that about the anus—is due to the slight film of fecal matter left after the use of dry paper for cleansing. These cases, even some of many years' duration, can be relieved by the use of toilet

3. Sparks, R. A.: Pruritus, J. Missouri M. A. **26**:24 (Jan.) 1929.

paper or cloth wet with water or boric acid solution after preliminary cleansing with dry paper. If no dermatitis other than that caused by scratching is present and no other definite cause as cited under etiology can be found, this method should always be tried. Even when another cause has been found and corrected, it is a wise adjunct treatment.

When this alone does not give entire relief, the addition of 1 per cent saponated solution of cresol or of 10 to 100 per cent solution of coal tar may succeed, or it may be necessary to use these antipruritics only occasionally. They are more generally acceptable than ointments.

If the skin is dry and fissured, ointments may be indicated. Zinc oxide ointment containing 1 per cent of phenol or from 10 to 25 per cent camphorated phenol may be used, or ointment of ammoniated mercury with or without the same antipruritics.

One source of acute dermatitis about the anus and genitalia is the use of anesthetic ointments, procaine hydrochloride or related drugs. Ethyl aminobenzoate, orthoform and the newer proprietary anesthetics, as well as resorcinol, used because of a real pruritus without inflammation, sometimes result in a sharp, often weeping, dermatitis which causes intense suffering and may be the beginning of a widespread inflammation of the skin.

Psychotherapy can cure some of the anogenital cases, especially in women. There are reports of such cases that have been proved to be due to fear of another pregnancy after a difficult delivery, fear of pregnancy in the unmarried, masturbation or other forms of sexual maladjustment. This is, of course, only repeating the statement of Fantus and Cornbleet [4] that local pruritus may be due to any of the causes of general pruritus.

In the baffling cases sometimes seen, one may use the injection of alcohol, originated by Stone in 1916. The area involved must be carefully mapped out, with special attention to the border areas, which the patient may have neglected to mention. Then the vulvar and perianal regions are cleansed as for other surgery, a general anesthetic is administered, and 95 per cent alcohol is injected, the needle entering perpendicularly into the skin. From 2 to 4 minims (0.12 to 0.25 cc.) is injected just under the skin at each point, the points being about one fourth inch apart. In older patients these points must be farther apart to avoid sloughing. This procedure succeeds in most cases in relieving itching for from several months to several years. It can be repeated if necessary. Blood vessels must be avoided.[5]

Surgical excision for pruritus is to be used only in extreme cases. It often fails to cure.

Bath Pruritus and Winter Itch.—These are both caused by dryness of the skin, the soap and water removing the oil and the dry air of winter, outdoors as well as indoors, removing the moisture. These causes are often combined. The difficulty is easily controlled by omitting soap from the bath, except for the extremities, face and flexures, and not bathing very frequently in the winter time. After the bath, while the skin is still damp, an emollient, such as borated cold cream, should be applied to the parts that tend to itch. Efforts should be made to increase humidity in the dwelling.

Senile Pruritus.—This is often classed with bath and winter itch but frequently is of entirely different etiology, as Rothman [6] points out. The skin of old persons with this condition, usually men, is often soft and pliable, a skin younger than its wearer. Prostatic hypertrophy and infection or renal disease with an increased deposit of waste matter in the skin is answerable for many of the cases, but in some no etiology is discoverable other than arteriosclerosis and decreased nutrition of the skin; not, however, enough to cause evident atrophy.

Mental Aspect.—Finally, the mental possibilities should be investigated in every case of persistent itching. Itching is peculiarly subject to suggestion, both unfavorable and favorable, and the proper frame of mind in the patient is a prime requisite for cure. Not every case requires psychoanalysis or hypnotism; but every patient needs encouragement and confidence in his physician. A painstaking investigation of possible worries or fears and a patient explanation of the evil effect of such emotions may often be the most important parts of the treatment. They should never be overlooked. Stokes and his school must be thanked for their insistence on the value of an awareness of these facts in the treatment of pruritus and pruritic disorders.

104 South Michigan Avenue.

4. Fantus, Bernard, and Cornbleet, Theodore: The Therapy of Itching (Pruritus), J. A. M. A. **106**:2144 (June 20) 1936.

5. Wilson, W. M.: Treatment of Pruritus Vulvae by Alcohol Injections, J. A. M. A. **110**:493 (Feb. 12) 1938.

6. Rothman, S.: Jucken und juckende Hautkrankheiten, Handbuch der Haut. u. Geschlechtskrankheiten, Berlin, Julius Springer, 1930, vol. 14.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

ATMORAY
(Ozone Generator)
NOT ACCEPTABLE

Manufacturer: Atmoray, Inc., 404 Davis Building, Third and Washington, Portland, Ore.

At times, in order to fulfil its assumed obligations to the medical profession and to the public, the Council may consider itself called on to investigate and prepare reports on devices which have not been submitted, if such reports, in the opinion of the Council, are important to public health and welfare. The advertising of Atmoray Inc. has been inspected and this report has been based on it.

In a pamphlet titled "Atmoray—With Therapeutic Values of Ozone" the Atmoray is described as a device used to deodorize and purify air by generating ozone. It is claimed that the Atmoray produces an "invisible ray" which drives out "injurious bacteria from affected parts of the body." No description of the mechanism of the device is given in the pamphlet and there is no statement as to what method is used to produce ozone, or how much ozone is produced.

The manner in which the device gives its declared therapeutic benefits is described by a portion of the pamphlet titled "The Atmoray (An Astounding Component of the Universe)." This portion states: "It produces pure ozone without heat and entirely without gases or deleterious action. The tubes may be placed upon any part of the bare body with absolute safety and any part of the anatomy will show outstanding, beneficial results. Atmoray not only produces ozone but with it an invisible ray that acts directly on the human organism. Nothing to take as Atmoray does the doing and the human body responds to the natural law. It is a matter of record where statements have been made by eminent scientists of this country that the direct action of ozone in the human body is

its attack on the impurities of the blood stream and while eliminating the impurities it builds and increases the red blood corpuscles. The ray from the Atmoray has an intensive penetrating quality by which it carries the ozone with it directly to the affected part of the anatomy. Back goes vitality to the body. Out goes injurious bacteria. The human system undergoes revitalization, the nerves relax, the blood purifies, and nature responds with the help of Atmoray."

The following portion from the pamphlet is apparently a further discussion of the "invisible rays": "The questions as to what are rays has a complete answer only with the Great Architect of the universe; and man in his ever consistent effort of development and learning succeeds in individualizing one now and then and the whole face of humanity undergoes another change lighting the way a little further down the path of truth."

It is apparently indicated that an attempt has been made to imply, through the use of confusing, indefinite statements, that the Atmoray has unexplainable mystic qualities. Where specific therapeutic claims are made, no evidence is given to substantiate the statements. There is no evidence, for example, that ozone will "attack the impurities of the blood stream and while eliminating the impurities it builds and increases the red blood corpuscles."

The pamphlet quotes Leo Verbon, a naprapath, of Portland, Ore.: "We have used several of your Atmoray machines in our hospital. . . . There is hardly a condition that we have not treated in this hospital where Atmoray Ozone Generator has not benefited them." Verbon cites several specific instances in which he considered the use of the Atmoray was the greatest contributing factor to recovery; he gives the most space to a case "suffering from cardiavascular-renal disease," although he also states that in his hospital the machine is "considered standard treatment in sinusitis and head colds and post-operative cases," and that it is very useful in the treatment of colitis and arthritis "because ozone inhibits bacteria growth." It is stated that the hospital also finds the Atmoray invaluable for deodorizing patients' rooms. In another part of the advertising the firm states "Disease germs are completely eliminated when coming in contact with ozone."

Ozone, regardless of where or how it is generated, has little or even no effect on bacteria or germs.[1] Experiments performed long ago on all kinds and types of bacteria in both the dry and moist condition showed that for ozone to be even a little effective it had to be present in such concentrations as were distinctly harmful to the delicate membranes of the nose, throat and lungs of a human being. Recent investigation has confirmed these observations.[2]

With reference to deodorizing through the use of ozone, the firm makes these statements: "Ozone in itself is one of the most effective oxodizing, germicidal, disinfecting, and deodorizing agents known; and for some time has been successfully employed for the purpose of converting foul and impure atmosphere into pure wholesome air. . . . It is a well known fact that our outside so-called pure air is ever increasingly permeated with carbon monoxide gases, and other injurious elements emanating from smoke of factories, internal combustion motors and many other contributing factors. . . . In purifying the air, ozone oxidizes all organic impurities, thus preventing the forming and supporting the life of malignant germs which give rise to unhealthy gases and obnoxious odors."

While ozone tends to fatigue the sensory nerve endings, governing the sense of smell so that an individual can no longer smell odors, it does not act as a deodorant—only as a masking agent or substitute odor.[3] As an oxidizer for fumes, odors or gases, ozone has also been found to be ineffective.[4]

Since irritation of the mucous membranes of the nose, throat and lungs, headaches, drowsiness, fatigue and a burning sensation in the eyes may all result from exposure to ozone,[5] the Atmoray is regarded by the Council as a device capable of being harmful to man.

The Council on Physical Therapy voted not to include the Atmoray on its list of accepted devices, because the Council believes that the marketing methods and advertising employed by the firm are inimical to the public welfare.

1. Jordan, E. O., and Carlson, A. J.: Ozone: Its Bactericidal, Physiologic and Deodorizing Action, J. A. M. A. **61**:1007 (Sept. 27) 1913.
2. Kendall, A. I., and Walker, A. W.: Effects of Ozone on Certain Bacteria, J. Infect. Dis. **58**:204 (March-April) 1936.
3. Wolfhugel: Ztschr. f. Biol. **31**:408, 1895.
4. Ozone in Ventilation, Pub. Health Rep. **35**:989 (April 23) 1920.
5. Kenrich: Zur Verwendung des Ozone in der Leftung, Ztschr. f. Hyg. u. Infektionskr. **73**:443, 1913. Jordan and Carlson.[1]

B-K PLANT EMERGENCY INHALATOR ACCEPTABLE

Manufacturer: Bishinger-Koehler Manufacturing Company, 7838-7842 Kelly Street, Pittsburgh.

The B-K Plant Emergency Inhalator is a portable device that can be attached to any standard cylinder of oxygen or oxygen-carbon dioxide mixtures for plant emergency treatment of respiratory failure or asphyxia. The firm claims that its basic mechanism is practically identical with the integral part of the mechanism of the previously accepted B-K Inhalator (THE JOURNAL, Sept. 5, 1936, p. 790). This unit differs only in not being fitted in a carrying case with two small tanks, but rather it may be attached to any gas tank for plant use. The control mechanism is also stated by the firm to be identical with the self-adjusting feed valve of the Paul Breathing Unit, Bureau of Mines Approval 1301.

No adjustment or setting of gas flow is necessary; the operator need only open the cylinder valve. The apparatus provides automatic control of the flow, is self compensating to the needs of the patient and thus delivers the volume of gas as determined by the pressure in the patient's lungs. As there is no continuous flow of gas, there is claimed to be no "bucking" of exhalation with a consequent reinhalation of exhaled air.

B-K Plant Emergency Inhalator.

If necessary, one person can operate the mechanism and administer artificial resuscitation. The apparatus gives the operator an audible indication of the number of respirations per minute, as well as of their character and depth, by a slight hissing sound.

The inhalator was submitted to a reliable investigator for investigation and on examination he found that the mechanism of the B-K Plant Emergency Inhalator is very similar to that of the complete B-K inhalator previously examined.

The Council on Physical Therapy voted to accept the B-K Plant Emergency Inhalator for inclusion on the Council's list of accepted devices.

CHA-GOBE NASAL FILTER NOT ACCEPTABLE

Manufacturer: C. K. Stotz, Farmington, Conn.

The Cha-Gobe Nasal Filter is a small device intended, according to the manufacturer, to be inserted into the nasal openings to provide relief from "hay fever and other nasal irritations caused by dust, flower pollen and animal hair." It consists of a stainless steel wire loop which bridges the nasal septum and holds two wire frames twisted to fit the nasal passages and covered by single-layer bags of silk cloth. According to the circular enclosed with the filter it "has been tested and proven successful in severe cases of hay fever."

The Council investigated the device:

Microscopic measurements of the silk mesh indicated that the openings vary from about $\frac{1}{50}$ to $\frac{1}{150}$ inch. Since the average ragweed pollen grain is about $\frac{1}{2,500}$ inch it appeared unlikely that these grains of pollen would fail to get through this filter. This was verified by placing a pinch of dry ragweed pollen in the silk bag, through which the powder sifted quite readily.

The apparatus was tried in the noses of two different patients. In neither of them did it fit properly and in one the space between the nose piece and the wall of the nose was considerable.

Further experiments were regarded unnecessary and unjustifiable, since it was quite evident that this "filter" could not keep back pollen and, therefore, could not prevent hay fever. Since pollen also has a port of entry through the mouth and eyes, prevention of its entry through the nose alone does not provide adequate protection from pollen in any case.

In the advertising circular the claim is made that the device will provide relief from head colds as well as hay fever. No evidence was submitted to substantiate these claims.

The Council on Physical Therapy voted to reject the Cha-Gobe Nasal Filter for inclusion on the Council's list of accepted devices.

WESTERN ELECTRIC AUDIOMETER, MODEL 6B ACCEPTABLE

Manufacturer: Western Electric Company, Inc., 195 Broadway, New York.

The Western Electric Audiometer, Model 6B, is designed to measure the acuity and range of hearing. The instrument and receivers are calibrated independently, so that any Western Electric audiometer may be fitted with any receiver of the Western Electric type for audiometers. Its dimensions are 10 by 12 by 18 inches and it operates on alternating or direct current. The receiver available for the 6B is a moving coil dynamic type with rubber caps to hold against the ears. A heterodyne oscillator type of circuit is employed. There is provision for attaching a microphone. Both air and bone conduction receivers are provided as standard equipment.

Western Electric Audiometer, Model 6B.

It has a sweep frequency circuit ranging from 128 to 9,747 cycles per second. Octaves, semioctaves and quarter octaves are indicated; others are interpolated. It is calibrated in 5 decibel steps for intensity. The maximum intensity range of the test tones above the normal threshold is given in the accompanying table.

The unit has a masking device with a single frequency tone and a transmitter which is optional accessory equipment. The reason, according to the firm, for the difference in range between the tone for hearing and for masking is that part of the audiometer output power is diverted electrically from the bone conduction receiver to the air conduction receiver used for masking the other ear and, in consequence, the power available for the bone conduction receiver is lessened.

Maximum Intensity Range of Test Tones Above Normal Threshold

Test Tone Cycles, Per Second	Air Conduction	Bone Conduction	Masked Bone Conduction
128	65	..	..
256	90	25	..
512	100	35	20
1024	105	45	25
2048	105	50	30
4096	100	55	30
8192	75	50	25
9747	70	45	..

The purity of tone is a function of intensity, and the extent to which the amplifier is loaded governs the harmonic output.

The Proposed Minimum Specifications for Audiometers for General Diagnostic Purposes, Z24.5 of American Standards Association, Dec. 1, 1937, were used as a standard in the following investigation conducted in a laboratory acceptable to the Council. These specifications are comparable to the "Minimum Requirements for Acceptable Audiometers," adopted by the Council on Physical Therapy.

Tests were made by operating the audiometer with alternating current of 60 cycles per second at 115 volts and with direct current at 115 volts.

It complied with the specifications in the following respects:

1. Range of frequency of test tone.
2. Control of intensity.
3. Accuracy of frequency.
4. Audiometer calibration.
5. Purity of tone.
6. Extraneous noise.

Operation of the audiometer from a direct current supply having a considerable amount of generator ripple gives rise to extraneous noise in the audiometer receiver, to the extent that the audiometer does not comply with specification.

The performance of the audiometer relative to the production of extraneous noise when operated on direct current is therefore dependent on the amount of ripple in the direct current supply. This condition has been recognized by the manufacturer and he will supply, as accessory equipment (external to the audiometer), a line filter which would be plugged into the power supply cord just before the audiometer.

A line filter was submitted by the manufacturer, and tests showed that the audiometer, when used in conjunction with such a line filter on a direct current supply having considerable generator ripple, meets the requirements of the specification.

According to the manufacturer, very few direct current installations would require the extra equipment, since most sources of direct current supply are relatively free from generator ripple.

The Council on Physical Therapy voted to accept the Western Electric Audiometer, Model 6B, for inclusion on the Council's list of accepted devices.

TELEX HEARING AID ACCEPTABLE

Manufacturer: Telex Products Company, 1645 Hennepin Avenue, Minneapolis.

The Telex Hearing Aid consists of the following parts:

Microphone and amplifier unit, Serial No. 10340.
Battery and flexible leather battery case.
Miniature crystal receiver with molded plastic ear piece.

The microphone and amplifier units are disk shaped, are 3⅛ inches in diameter by 1 inch deep and weigh approximately 5¼ ounces. The battery case with the battery, approximately 4¼ by 3¼ by 1⅛ inches in size, weighs 14½ ounces. The receiver is 1 inch in diameter by 9/32 inch deep and with the molded ear piece and cord weighs approximately one-half ounce. The microphone and amplifier unit is provided with a knurled disk by which the volume is controlled.

Battery Consumption.—The A battery is a single 1½ volt cell and the current drawn at all settings of the volume control is 130 milliamperes. The B battery is a 30 volt unit and the current drawn is about 1 milliampere but varies according to the volume control.

Internal Noise.—The internal noise is so low as to be unobjectionable.

Amplification.—Amplification measurements at discrete frequencies were made audiometrically with two deaf subjects. The following are typical of the results of repeated measurements using 30 volts B battery:

Frequency	128	256	512	1,024	2,048	4,096
Gain:						
¼ full volume	4	6	19	20	21	9
full volume	16	17	30	31	30	17

Articulation Tests.—Articulation tests were conducted using transmitter 10340 on two deaf subjects. The volume control was set for comfortable hearing of speech at a distance of 5 feet. Sentence intelligibility under these conditions was 100 per cent and syllable articulation was in one case 96 per cent and the other 88 per cent.

The Council on Physical Therapy voted to accept the Telex Hearing Aid (10340 type of microphone) and amplifier unit for inclusion on its list of accepted devices.

MEDICAL LICENSURE STATISTICS FOR 1939

ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

Medical licensure and allied statistics are presented herewith for the thirty-eighth consecutive year. This report by the Council on Medical Education and Hospitals of the American Medical Association covers the year 1939 and includes data regarding (*a*) medical examining and licensing boards of the United States, the District of Columbia, the territories and the possessions of the United States, (*b*) examining boards in the medical specialties, (*c*) boards of examiners in the basic sciences and (*d*) the National Board of Medical Examiners.

The official reports which form the basis of these computations have been contributed throughout the year by the medical licensing boards of all states, the District of Columbia, Alaska, the Canal Zone, Hawaii, Puerto Rico and the Virgin Islands; the homeopathic boards of Connecticut, Delaware, Louisiana and Maryland; the fourteen basic science boards in operation last year (Arizona, Arkansas, Colorado, Connecticut, District of Columbia, Florida, Iowa, Minnesota, Nebraska, Oklahoma, Oregon, South Dakota, Washington and Wisconsin); the fourteen approved examining boards in the medical specialties, namely anesthesiology, dermatology and syphilology, internal medicine, obstetrics and gynecology, ophthalmology, otolaryngology, orthopaedic surgery, pathology, pediatrics, plastic surgery, psychiatry and neurology, radiology, surgery and urology, and the National Board of Medical Examiners. The homeopathic and eclectic examining boards of Arkansas did not license any one during the year.

The cooperation of the officers of the agencies in furnishing complete reports makes possible these annual compilations. The Council and THE JOURNAL express thanks and appreciation to those who have supplied these data, for without such help the presentation of the calculations included in the following pages would not have been possible.

Each week there appear in THE JOURNAL dates of coming examinations of state licensing and basic science boards, special boards and the National Board of Medical Examiners. Soon after they are held, blanks for recording and placing on file in the archives of the Association the results of such tests are regularly mailed. Reports of all examinations and those licensed by endorsement of credentials are carefully checked with the biographic file of physicians and the proper entry is made. In the occasional instance in which the applicant, according to the records, has not graduated or there is some irregularity, the board is notified. The reports are thereafter used for statistical compilations and then permanently filed. Credentials of physicians coming from abroad are verified by direct correspondence with official agencies abroad so far as is possible. More than thirty licensing boards obtain from the Council verification of biographic data and other claims before granting a license or permission to take the licensing examination. This service is available to all boards.

The tables referring to medical licensing boards include figures regarding the number of candidates examined for medical licensure in 1939, the number licensed and the number added to the profession. The state boards are discussed first, followed by the special boards, the basic science boards and the National Board of Medical Examiners.

LICENSES ISSUED

The figures presented in the first table cover the number of licenses issued in the various states, territories and possessions, both by examination and reciprocity or endorsement of state licenses or by the certificate of the National Board of Medical Examiners. During the year 1939 there were 9,260 licenses issued to practice medicine and surgery in the forty-eight states, the District of Columbia, Alaska, the Canal Zone, Hawaii, Puerto Rico and the Virgin Islands. Of the 9,260 licenses, 6,394 were issued after examination and 2,866 by reciprocity and endorsement. In several states (table 17) the internship is a requisite

(Continued on page 1638)

TABLE 1.—*Licenses Issued, 1939*

	On the Basis of		
	Examination	Reciprocity and Endorsement	Total
Alabama	7	50	57
Arizona	11	11	22
Arkansas	68	22	90
California	382	241	623
Colorado	69	31	100
Connecticut	53	67	120
Delaware	11	3	14
District of Columbia	54	55	109
Florida	172	0	172
Georgia	90	38	128
Idaho	24	0	24
Illinois	536	96	632
Indiana	113	69	182
Iowa	94	69	163
Kansas	86	24	110
Kentucky	85	57	142
Louisiana	73	21	94
Maine	42	16	58
Maryland	146	55	201
Massachusetts	277	101	378
Michigan	238	144	382
Minnesota	217	27	244
Mississippi	22	35	57
Missouri	211	75	286
Montana	11	19	30
Nebraska	78	16	94
Nevada	4	11	15
New Hampshire	30	28	58
New Jersey	257	101	358
New Mexico	2	47	49
New York	1,024	415	1,439
North Carolina	57	68	125
North Dakota	17	9	26
Ohio	365	119	484
Oklahoma	41	37	78
Oregon	26	29	55
Pennsylvania	549	63	612
Rhode Island	25	14	39
South Carolina	48	22	69
South Dakota	15	3	18
Tennessee	181	30	211
Texas	208	176	384
Utah	17	28	45
Vermont	24	10	34
Virginia	113	66	179
Washington	59	47	106
West Virginia	33	59	92
Wisconsin	111	61	172
Wyoming	8	12	20
U. S. Territories and Possessions *	30	19	49
Totals	6,394	2,866	9,260

* Alaska, the Canal Zone, Hawaii, Puerto Rico and the Virgin Islands.

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	22 Minnesota P	F	Marginal Number
	ARKANSAS																																												
1	University of Arkansas School of Medicine	..	..	..	..	67	0	0	1	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
	CALIFORNIA																																												
2	College of Medical Evangelists	1	0	1	0	..	..	59	2	..	..	..	..	..	..	..	..	1	0	4	0	4	0	1	0	..	..	..	..	1	0	..	..	..	..	1	0	..	..	1	0	..	..	1	0	2
3	Stanford University School of Medicine	..	..	..	..	..	..	52	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	3
4	University of California Medical School	..	..	1	0	..	..	59	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	4
5	University of Southern California Sch. of Med.	..	..	1	0	..	..	41	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
	COLORADO																																												
6	University of Colorado School of Medicine	..	..	..	..	..	..	2	0	38	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
	CONNECTICUT																																												
7	Yale University School of Medicine	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	..	..	7
	DISTRICT OF COLUMBIA																																												
8	George Washington University School of Med.	..	..	..	..	..	..	2	0	..	..	..	..	..	..	20	0	2	0	..	..	..	..	1	0	..	..	..	..	..	..	6	1	..	..	..	..	..	..	..	..	2	0	8
9	Georgetown University School of Medicine	..	..	..	..	..	..	..	..	..	..	3	0	1	0	8	0	0	1	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	1	0	3	2	1	0	..	..	9
10	Howard University College of Medicine	..	..	..	..	..	..	1	0	..	..	..	..	6	0	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10
	GEORGIA																																												
11	Emory University School of Medicine	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	24	2	41	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	1	0	2	0	11
12	University of Georgia School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	2	31	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12
	ILLINOIS																																												
13	Loyola University School of Medicine	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	0	3	0	..	..	1	0	71	0	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	2	0	1	0	13
14	Northwestern University Medical School	..	..	..	..	..	..	8	0	2	0	..	..	..	..	1	0	3	0	..	..	1	0	67	0	1	0	..	..	1	0	..	..	1	0	..	..	1	0	..	..	4	0	9	0	17	0	14
15	University of Chicago, Rush Medical College	..	..	1	0	..	..	9	2	4	0	..	..	..	..	..	..	3	0	..	..	1	0	46	0	..	..	3	0	1	0	..	..	..	..	..	..	1	0	..	..	4	0	4	0	14	0	15
16	University of Chicago, The School of Medicine	..	..	..	..	1	0	1	0	1	0	..	..	..	..	1	0	2	1	1	0	1	0	11	0	..	..	..	..	1	0	1	0	1	0	..	..	..	..	..	..	1	0	2	0	1	0	16
17	University of Illinois College of Medicine	..	..	..	..	..	..	6	0	..	..	0	1	..	..	1	0	1	1	..	..	1	0	148	0	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	4	0	3	0	17
	INDIANA																																												
18	Indiana University School of Medicine	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	2	0	..	..	..	..	..	..	99	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	18		
	IOWA																																												
19	State University of Iowa College of Medicine	..	..	..	..	..	..	5	0	..	..	1	0	..	..	..	..	1	0	..	..	1	0	..	..	..	..	99	1	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	2	0	19
	KANSAS																																												
20	University of Kansas School of Medicine	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	70	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20
	KENTUCKY																																												
21	University of Louisville School of Medicine	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	4	0	..	..	2	0	..	..	..	..	..	..	..	..	..	..	79	0	..	..	..	..	..	..	..	..	..	..	..	..	21
	LOUISIANA																																												
22	Louisiana State University School of Medicine	1	0	1	0	..	..	1	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	59	0	..	..	1	0	..	..	..	..	..	..	..	..	22
23	Tulane University of Louisiana School of Med.	5	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16	1	4	0	..	..	..	..	..	..	..	..	..	..	..	..	83	0	..	..	..	..	..	..	2	0	..	..	1	0	23
	MARYLAND																																												
24	Johns Hopkins University School of Medicine	1	0	..	..	..	..	3	0	..	..	..	..	..	..	..	..	5	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	54	0	1	0	..	..	4	0	24
25	University of Maryland School of Medicine and College of Physicians and Surgeons	..	..	..	..	..	..	1	0	..	..	2	1	1	0	1	0	3	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	82	0	0	1	..	..	..	..	25
	MASSACHUSETTS																																												
26	Boston University School of Medicine	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	0	..	..	0	1	..	..	..	26
27	Harvard Medical School	..	..	..	..	..	..	6	0	..	..	4	0	..	..	..	..	3	1	3	0	2	0	4	0	2	0	..	..	..	..	..	..	..	..	..	..	..	..	12	0	3	0	0	4	0	2	0	27
28	Tufts College Medical School	..	..	..	..	..	..	..	..	..	..	7	1	..	..	..	..	2	0	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	1	0	4	0	..	..	26	1	..	..	..	..	28
	MICHIGAN																																												
29	University of Michigan Medical School	..	..	..	..	..	..	2	0	..	..	..	..	..	..	1	0	2	0	..	..	..	..	1	0	..	..	..	..	1	0	..	..	..	..	1	0	..	..	4	0	90	0	2	0	29		
30	Wayne University College of Medicine	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	63	0	..	..	30		
	MINNESOTA																																												
31	University of Minnesota Medical School	..	..	..	..	..	..	4	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	..	..	1	0	1	0	..	..	5	0	119	0	31		
	MISSOURI																																												
32	St. Louis University School of Medicine	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	3	0	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	32
33	Washington University School of Medicine	..	..	..	..	..	..	8	0	..	..	..	..	..	..	1	0	1	1	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	2	0	33
	NEBRASKA																																												
34	Creighton University School of Medicine	..	..	1	0	..	..	13	2	1	0	1	0	..	..	..	..	..	..	1	0	..	..	2	0	..	..	5	0	5	0	..	..	2	0	..	..	..	..	..	..	2	0	..	..	1	0	34
35	University of Nebraska College of Medicine	..	..	..	..	..	..	7	0	..	..	..	..	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	3	0	1	0	..	..	35
	NEW YORK																																												
36	Albany Medical College	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	36
37	Columbia University Coll. of Phys. and Surgs.	..	..	1	0	..	..	2	0	..	..	3	0	..	..	1	0	4	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	5	0	..	..	..	..	..	..	37
38	Cornell University Medical College	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	1	0	2	0	38
39	Long Island College of Medicine	1	0	..	..	..	..	1	0	..	..	1	0	..	..	..	..	2	1	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	39
40	New York Medical College, Flower and Fifth Avenue Hospitals	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	40
41	New York University College of Medicine	..	..	..	..	..	..	2	0	..	..	3	0	..	..	0	1	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	3	0	..	..	..	..	41
42	Syracuse University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	42
43	University of Buffalo School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	43
44	Univ. of Rochester Sch. of Med. and Dentistry	..	..	..	..	..	..	..	..	..	..	3	0	..	..	..	..	1	0	..	..	..	..	3	0	..	..	..	..	..	..	..	..	1	0	1	0	..	..	..	..	2	0	..	..	..	..	44
	NORTH CAROLINA																																												
45	Duke University School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	6	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	1	0	..	..	..	..	45
	OHIO																																												
46	Ohio State University College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	2	0	46
47	University of Cincinnati College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	47
48	Western Reserve University School of Medicine	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	48
	OKLAHOMA																																												
49	University of Oklahoma School of Medicine	..	..	..	..	..	..	3	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
	OREGON																																												
50	University of Oregon Medical School	..	..	..	..	..	..	11	0	..	..	..	..	..	..	1	0	..	..	1	0	2	0	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	4	0	50		
	PENNSYLVANIA																																												
51	Hahnemann Medical Coll. and Hosp. of Phila.	..	..	..	..	..	..	0	1	..	..	5	0	2	1	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	14	0	1	0	..	..	1	0	51		
52	Jefferson Medical College of Philadelphia	..	..	..	..	..	..	2	0	..	..	2	0	4	0	2	0	3	1	..	..	..	..	2	1	..	..	..	..	..	..	1	0	..	..	1	0	2	0	..	..	1	0	2	0	..	..	52
53	Temple University School of Medicine	..	..	..	..	..	..	2	0	..	..	2	1	1	0	1	0	7	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	2	0	..	..	53
54	University of Pennsylvania School of Medicine	..	..	..	..	..	..	2	0	..	..	..	..	2	1	1	0	7	1	..	..	1	0	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	54
55	University of Pittsburgh School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	6	0	54
56	Woman's Medical College of Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	1	0	56
	SOUTH CAROLINA																																												
57	Medical College of the State of South Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	4	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	57		
	TENNESSEE																																												
58	Meharry Medical College	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	1	0	58
59	University of Tennessee College of Medicine	1	0	..	..	..	..	3	0	..	..	..	..	..	..	..	..	6	1	..	..	1	0	..	..	..	..	..	..	2	0	1	0	..	..	..	..	..	..	..	..	1	0	..	..	1	0	59
60	Vanderbilt University School of Medicine	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	0	..	..	2	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22																									

P = Passed; F = Failed.

Marginal Number	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii and Puerto Rico	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by Marginal Number
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F					
1	1 1 0								4 1						2 0		1 0												80	78	2	2.5	7 1
2							1 0			3 0		2 0							2 0					5 0		1 0			97	94	3	3.1	17 2
3												1 0		1 0										1 0				1 0	99	96	3	3.3	7 3
4																												1 0	63	62	1	1.6	4 4
5						1 0	0 1																			1 0			45	44	1	2.2	5 5
6									3 0 1 0										1 0	1 0 2 0							1 0 2 0		51	51	0	0.0	9 6
7							1 0		2 0																				7	7	0	0.0	6 7
8						1 0	3 0		2 2			5 0			14 0								1 0 1 0						63	60	3	4.8	13 8
9							15 4 1 0	12	2			3 0			9 0 3 0				1 0				1 0				1 0		74	65	9	12.2	18 9
10		1 0							1 1 0 0						3 0		1 0		4 0				5 1		1 0				33	31	2	6.1	12 10
11									1 0 1 0						1 0										1 0		1 0		78	76	2	2.6	11 11
12										1 0															1 0				41	39	2	4.9	4 12
13		2 0		1 0 1 0 3 0					6 3			4 0			6 0			1 0					1 0		1 0				113	108	5	4.4	19 13
14	2 0								5 1 1 0 3 0			3 0		1 0	3 0			2 0			3 0		9 0 2 0	11 0 1 0 1 0					104	103	1	0.6	27 14
15	2 0 3 0					2 0 8 0			5 0			5 0		1 0	4 0			2 0		1 0 4 0			6 0 2 0	3 0					141	139	2	1.4	26 15
16									5 0			3 0						1 0			1 0			1 0					36	37	1	2.6	19 16
17							1 0		2 1			1 0						1 0		2 0				2 0		1 0			180	177	3	1.7	17 17
18									1 0								1 0								1 0				108	108	0	0.0	8 18
19												1 0		1 0	1 0					3 0									109	108	1	0.9	11 19
20									0 1						1 0										1 0				76	74	2	2.6	6 20
21							1 0		4 2		1 0 1 0			1 0					1 0	1 0 1 0				1 0		2 0		1 0	104	102	2	1.9	15 21
22							1 0		5 0						1 0													1 0	73	73	0	0.0	11 22
23	6 0					1 0				4 0					1 0		1 0			2 0				1 0					3 0	133	132	1	0.8	14 23
24									1 0						4 0 1 0								1 0					1 0	78	77	1	1.3	12 24
25							3 0		1 0 4 0						7 0		1 0			1 0								2 0	113	111	2	1.8	15 25
26				2 0 1 1																									21	19	2	9.5	6 26
27		2 0 1 0		2 0 3 0					11 0 2 0 1 0 3 0						2 0 1 0 1 0			1 0	1 0				1 0 2 0		1 0		1 0	166	165	1	0.9	20 27
28		1 0		2 0 1 0					1 1			1 0			7 0													39	36	3	5.1	13 28
29							1 0		2 0			1 0								1 0			1 0		1 0		1 0		118	118	0	0.0	16 29
30									0 2										1 0								1 0		70	68	2	2.9	7 30
31	1 0 2 0						2 0		1 1	2 1 1 0					2 0			3 0							4 0				152	150	3	2.0	16 31
32	9 0						1 0		3 1						6 0				15 0	1 0			1 0 1 0						131	130	1	0.8	12 32
33	9 0								2 3 1 0			1 0			2 0					3 0			1 0 3 0				1 0		122	118	4	3.3	15 33
34	1 0 1 0	16 0							3 4	1 0 2 0	1 0	1 0			2 0			3 0			2 0		1 0 2 0			2 0			78	72	6	7.7	25 34
35		42 0							1 0						2 0			1 0							2 0		1 0		84	84	0	0.0	11 35
36									4 1			1 0																	10	8	2	20.0	5 36
37							2 0		70 5			1 0			1 0														98	93	5	5.1	12 37
38		1 0					2 0		47 1			1 0			2 0														63	62	1	1.6	12 38
39							7 0		71 2						3 0										1 0		1 0		94	91	3	3.2	12 39
40							4 0		14 2						1 0														24	22	2	8.3	6 40
41		1 0					3 0		103 2			1 0			1 0										1 0				130	127	3	2.3	12 41
42							1 0		37 5																				44	39	5	11.4	3 42
43									16 5						1 0 1 0														27	21	6	22.6	7 43
44									20 2			8 0			1 0										1 0		1 0		45	43	2	4.4	11 44
45										3 0					2 0					1 0					2 0				18	17	1	5.6	9 45
46												60 0			2 0										1 0				60	60	0	0.0	7 46
47										1 0		61 0			2 0										2 0		1 0		75	75	0	0.0	7 47
48												61 0			1 0										1 0 1 0				67	67	0	0.0	7 48
49									2 0				42 0 1 0																50	50	0	0.0	6 49
50									1 0	1 0			15 0								3 0			11 0		1 0			53	53	0	0.0	12 50
51							30 12		6 3			7 0			82 0 2 0				1 0				1 0		2 0				168	150	18	10.7	17 51
52							16 2		5 1 7 0			4 0		1 0	79 0 2 0				1 0				1 0		2 0		1 0 1 0		147	142	5	3.4	22 52
53							8 1		8 1 5 0			1 0			85 1 1 0 1 0								1 0			1 0			131	127	4	3.1	16 53
54		2 0					14 5		9 1 8 0			3 0			160 0			1 0	3 0		1 0			1 0		1 0			172	166	6	3.5	21 54
55															59 0														63	63	0	0.0	5 55
56							2 0		2 1						12 0														20	18	2	10.0	4 56
57		1 0							1 0 1 0						1 0		37 0								2 0				50	49	1	2.0	9 57
58		1 0													1 0				38 0	1 1									38	37	1	2.6	6 58
59	8 0									1 0					2 0		1 0		49 0	1 0					1 0				120	119	1	0.8	15 59
60	2 0									2 0						1 0	2 0		40 0										55	55	0	0.0	9 60
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50					

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Del. Columbia P	F	8 Florida P	F	9 Georgia P	F	10 Idaho P	F	11 Illinois P	F	12 Indiana P	F	13 Iowa P	F	14 Kansas P	F	15 Kentucky P	F	16 Louisiana P	F	17 Maine P	F	18 Maryland P	F	19 Massachusetts P	F	20 Michigan P	F	21 Minnesota P	F	Marginal Number
	TEXAS																																										
61	Baylor University College of Medicine			1	0											2	0																					0	1	1	0			61
62	University of Texas School of Medicine															1	0																											62
	VERMONT																																										
63	University of Vermont College of Medicine											1	1																					1	0			0	1			1	0	63
	VIRGINIA																																										
64	Medical College of Virginia															2	1			1	0									1	0					1	0			1	0			64
65	University of Virginia Department of Medicine											1	0			1	0	2	1																	1	0	1	0	1	0	65
	WISCONSIN																																										
66	Marquette University School of Medicine							2	1			1	0			2	1					5	0													1	0	2	0	4	0	66
67	University of Wisconsin Medical School			1	0			4	0													2	0													1	0	1	0	5	0	67
	CANADA																																										
68	Dalhousie University Faculty of Medicine																																										68
69	Laval University Faculty of Medicine																																			1	0							69
70	McGill University Faculty of Medicine	1	0					22	0	1	0	1	0			1	0					2	0											1	0	2	0	1	0	5	0	2	0	3	0	70
71	Queen's University Faculty of Medicine	1	0																			1	0																					71
72	University of Alberta Faculty of Medicine							1	0							1	0																									1	0	72
73	University of Manitoba Faculty of Medicine																																									2	0	73
74	University of Montreal Faculty of Medicine																																										74
75	University of Toronto Faculty of Medicine													1	0	0	1					9	0																			1	1	75
76	University of Western Ontario Medical School															1	0					2	0													1	0			1	0			76
77	Foreign Medical Faculties							21	7			6	39			1	1	1	0	0	8	79	17	2	0	5	1							2	5	10	15	65	25					77
78	Extinct Medical Schools															1	2																					3	0					78
79	Unapproved Schools			2	1			22	3	1	1					2	0					51	0													60	222					79
80	Totals	14	12	68	402	72	169	13	54	199	90	32	541	108	106	85	88	153	48	262	534	217	80
81	Totals—Examined—Passed	14	11	68	382	69	53	11	54	172	90	24	521	108	104	85	88	153	42	187	277	217	217	81
82	Totals—Examined—Failed	0	1	0	20	3	47	2	0	27	0	8	18	0	2	0	0	0	6	16	257	0	1	82
83	Percentage—Failed	0.0	8.3	0.0	5.0	4.2	47.0	15.4	0.0	13.6	0.0	25.0	3.3	0.0	1.9	0.0	0.0	0.0	12.5	7.9	48.1	0.0	0.5	83
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

P = Passed; F = Failed.

(CONTINUED FROM PAGE 1635)

for practice but a physician is permitted to take the examination in most of these states and if successful his license is withheld until completion of the internship. This practice is followed by recent graduates. Licenses are also withheld for proof of citizenship and for minor technicalities. In some states also the licenses of those examined in December are dated and issued early in the following year. The 9,260 licenses issued include, therefore, many who were examined in 1938 and even a few in previous years. New York issued the largest number of licenses, 1,439, California 623, Illinois and Pennsylvania 612. These states are the only ones which registered more than 500. Twenty-three states, Alaska, the Canal Zone, Hawaii, Puerto Rico and the Virgin Islands licensed less than 100. Candidates were licensed after examination in every state, the lowest being two in New Mexico. The Canal Zone and the Virgin Islands licensed none by examination. Three were registered in the Virgin Islands, two in the Canal Zone, five in Alaska, eleven in Puerto Rico and twenty-eight in Hawaii. Of those registered in the last three named, one in Alaska, three in Puerto Rico and ten in Hawaii were licensed by reciprocity or endorsement. The states of Florida and Idaho grant licenses only on the basis of examination. Massachusetts and Rhode Island have no reciprocity privileges but endorse diplomates of the National Board of Medical Examiners. Figures for four previous years are shown for comparison in table 3.

TABLE 3.—*Licenses Issued on the Basis of Examination, Reciprocity and Endorsement, 1935-1939*

	Examination	Reciprocity and Endorsement	Total
1935	5,718	2,193	7,911
1936	6,272	2,768	9,040
1937	6,687	3,155	9,842
1938	6,550	2,947	9,497
1939	6,394	2,866	9,260
Totals	31,561	13,929	45,550

The total number licensed in 1939, 9,260, was 237 less than in 1938 and 562 fewer than 1937 but 220 more than in 1936 and 1,349 more than in 1935. On the basis of examination the figures decreased 156 and those licensed by reciprocity and endorsement decreased eighty-one compared with the figures for 1938. The 9,260 licenses issued do not, however, represent individuals, since several have been licensed in more than one state during the year. Nor do they represent additions to the medical profession at large, since the majority of the 2,866 licensed by reciprocity and endorsement with the exception of the National Board diplomates, have migrated from other states. Table 12 shows how many of those licensed were never before registered and therefore represent the number added to the medical profession in the United States and its territories and possessions in 1939.

CANDIDATES EXAMINED BY MEDICAL EXAMINING BOARDS IN 1939

Figures referring to those examined for medical licensure by individual states throughout the year, giving the number who passed and failed in each state, are included in table 2. There were 7,753 examined, of whom 6,489 passed and 1,264 failed, representing sixty-seven four year approved medical schools in the United States and nine of the medical schools of Canada, eighty-six faculties of medicine and three licensing corporations of other countries, seven medical schools now extinct, nine unapproved institutions and several osteopathic colleges. Osteopaths who were granted the privilege to practice medicine, surgery or

Marginal Number	Rhode Island	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii and Puerto Rico	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by	Marginal Number
	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P						
61									1	0										68	1								75	73	2	2.7	6	61
62		9	0																	80	0		1	0					97	97	0	0.0	6	62
63									5	2												14	0						26	22	4	15.4	6	63
64							1	0	0	2	5	0			3	0							41	0	6	0	1	0	1	67	64	3	4.5	12	64
65															2	0	1	0					23	0	1	0			1	66	65	1	1.5	11	65
66							1	0	1	2			1	0	1	0			1	0							11	0		68	63	5	7.3	13	66
67		1	0						1	0		1	0	0	1	0									1	0	0	1	0	65	65	0	0.0	17	67
68									15	1														1	0				17	16	1	5.9	2	68
69																													1	1	0	0.0	1	69
70		1	0			4	0	2	0	10	3		1	0	2	0			1	0			1	0	3	0			72	69	3	4.2	22	70
71										3	4													1	0				10	6	4	40.0	4	71
72										1	0																		4	4	0	0.0	4	72
73										1	0		1	0															5	5	0	0.0	4	73
74										1	0																		1	1	0	0.0	1	74
75		1	0							5	0		1	0	2	0			5	1	1	0							21	20	1	9.7	12	75
76		1	0							4	0		2	0					1	0					1	0			15	15	0	0.0	4	76
77		6	0	1	0				1	1	69	79	1	0	472	621			1	0	54	15			25	9	2	0			1	0	8	7			1	0	2	0	4	1			4	2	1,602	839	853	50.4	27	77
78																																	1	0	7	5	2	28.6	3	78
79						0	1	45	8							36	0		1	0	1	0			22	6			1	0				0	1	0	2	319	274	245	47.2	15	79
80	21	211	11	78	4	16	348	2	1,718	57	18	384	43	26	260	25	48	15	191	221	17	17	114	60	33	111	9	34	7,753	.....	.....	.....	.....	80
81	21	211	11	78	4	14	237	2	1,624	57	17	369	43	26	549	25	48	15	191	208	17	17	113	59	33	111	8	30	.....	6,480	.....	.....	.....	81
82	0	0	0	0	0	2	111	0	694	0	1	15	0	0	11	0	0	0	0	15	0	0	1	1	0	0	1	4	.....	.....	1,264	.....	.....	82
83	0.0	0.0	0.0	0.0	0.0	12.5	31.9	0.0	40.4	0.0	5.6	3.9	0.0	0.0	2.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.9	1.7	0.0	0.0	11.1	10.8	.....	.....	.....	16.3	..	83
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

both by the medical board are included in these statistics, eliminating, for instance, those osteopaths in California who were granted privileges as physicians and surgeons by the osteopathic board. There were 5,379 graduates of approved medical schools in the United States examined, of whom 2.8 per cent failed; 156 graduates of approved Canadian medical schools, 7.1 per cent of whom failed; 1,692 graduates of schools outside the United States and Canada, principally in Europe, with 50.4 per cent failures; seven who graduated from medical schools now extinct with 28.6 per cent of failures, and 519 from unapproved and osteopathic schools, of whom 47.2 per cent failed. These 519 represented 168 graduates of osteopathic schools, of whom ninety-eight passed and 41.7 per cent failed; 351 graduates of unapproved schools, of whom 176 passed and 175, 49.9 per cent, failed. Graduates of osteopathic schools were examined by the medical boards of eight states, Colorado, Connecticut, Massachusetts, New Hampshire, New Jersey, Oregon, Texas and Wyoming, while graduates of unapproved schools were examined in eight states and Puerto Rico—Arizona, Florida, Illinois, Massachusetts, Ohio, Pennsylvania, Texas and Virginia. Of the 168 osteopaths, sixty were examined in Massachusetts, fifty-three in New Jersey, twenty-five in Texas and twenty-five in Colorado. Other states examined fewer than three. Of the graduates of other than recognized schools, Massachusetts examined 251, Illinois fifty-one and Ohio thirty-six. All other states examined fewer than five. Osteopaths in Colorado, Massachusetts, New Hampshire, New Jersey and Texas were examined in medicine and surgery, those in Oregon and Wyoming only in surgery, while Connecticut examined one in surgery and one in medicine.

The 7,753 examined do not represent individuals, since a candidate might take the examination in more than one state and would be counted in each state. This applies to those who pass or fail, or those who fail and later pass in one or more states, or pass in one state and later in the same year fail elsewhere. However, if a candidate fails more than once in a given state within the year he is counted in that state only once as a failure.

Three of the five homeopathic boards in existence, Connecticut, Delaware and Maryland, examined twenty-one candidates, one of whom failed. The homeopathic board in Arkansas did not examine any one during the year, while the homeopathic board of Louisiana registered one by reciprocity. The one eclectic board in existence, in Arkansas, did not examine a candidate.

The largest number of graduates of any one school examined was 180, representing the University of Illinois College of Medicine. One hundred and sixty-four graduates of Northwestern University Medical School were examined in twenty-seven states, while 168 from the Hahnemann Medical College of Philadelphia were examined in seventeen states.

Albany Medical College and the University of Buffalo School of Medicine had the highest percentage of failures in the United States, 20.0 and 22.6 per cent, respectively. Fifteen schools in the United States had no failures before medical licensing boards, thirty-seven schools less than 5 per cent, nine between 5 and 10 per cent and six more than 10 per cent.

Graduates of Harvard Medical School were examined in the greatest number of states, thirty, graduates of Northwestern University Medical School by twenty-seven states, Rush Medical College twenty-six, Creighton University School of Medicine twenty-five, Jefferson Medical College twenty-two, and the University of Pennsylvania twenty-one. All other schools had their graduates examined in fewer than twenty

(CONTINUED ON PAGE 1642)

Marginal Number	SCHOOL	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 Dist. Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine	19 Maryland	20 Massachusetts	21 Michigan	22 Minnesota	Marginal Number
		P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	
	ARKANSAS																							
1	University of Arkansas School of Medicine			67 0 0 1						2 0														1
	CALIFORNIA																							
2	College of Medical Evangelists	1 0 1 0			39 2					1 0 4 0	3 0		1 0					1 0		1 0 0 1	7 0			2
3	Stanford University School of Medicine				39 1								1 0										1 0	3
4	University of California Medical School		1 0		39 1																			4
5	University of Southern California Sch. of Med.				41 0																			5
	COLORADO																							
6	University of Colorado School of Medicine				2 0	38 0																		6
	CONNECTICUT																							
7	Yale University School of Medicine																		1 0			1 0		7
	DISTRICT OF COLUMBIA																							
8	George Washington University School of Med.				2 0				32 0	1 0			1 0							4 0			1 0	8
9	Georgetown University School of Medicine						3 0	1 0	4 0										1 0	1 0	1 0	1 0		9
10	Howard University College of Medicine				1 0				2 0				1 0											10
	GEORGIA																							
11	Emory University School of Medicine				1 0						19	1	41 0								1 0	1 0		11
12	University of Georgia School of Medicine										4	1	31 0											12
	ILLINOIS																							
13	Loyola University School of Medicine						1 1			1 0		1 0	71 0	2 0						0	1 2 0	1 0		13
14	Northwestern University Medical School				3 0 1 0					2 0			67 0	1 0		1 0		1 0		1 0	3 0 1 0		14
15	University of Chicago, Rush Medical College				0 2 4 0					2 0		1 0	44 0		3 0	1 0				1 0	3 0 4 0		15
16	University of Chicago, The School of Medicine			1 0	1 0 1 0								11 0			1 0	1 0	1 0		1	0 2 0	1 0		16
17	University of Illinois College of Medicine				6 0		0 1				1	0	1 0	2 0							4 0	3 0		17
	INDIANA																							
18	Indiana University School of Medicine				1 0					1 0				0										18
	IOWA																							
19	State University of Iowa College of Medicine				5 0		1 0								0	1								19
	KANSAS																							
20	University of Kansas School of Medicine				2 0											0	0							20
	KENTUCKY																							
21	University of Louisville School of Medicine				2 0					1 0		2 0					0	0						21
	LOUISIANA																							
22	Louisiana State University School of Medicine	1 0 1 0			1 0								1 0				0	0	1 0					22
23	Tulane University of Louisiana School of Med.	5 0							13	1 4	0						0	0		1	0			23
	MARYLAND																							
24	Johns Hopkins University School of Medicine	1 0																		0			1 0	24
25	University of Maryland School of Medicine and College of Physicians and Surgeons				1 0		2 1	1 0	1 0	1 0		1 0								0				25
	MASSACHUSETTS																							
26	Boston University School of Medicine							1 0											4 0		4 0			26
27	Harvard Medical School				0 0		1 0				1 0	1 0	1 0	2 0			1 0		7 0	3 0	10 0 4 0	1 0	27
28	Tufts College Medical School						0 1			1 0			1 0						3 0		2 0			28
	MICHIGAN																							
29	University of Michigan Medical School				2 0					1 0			1 0			1 0			1 0		1 0 2 0	1 0		29
30	Wayne University College of Medicine				1 0								1 0							1	0 4 0			30
	MINNESOTA																							
31	University of Minnesota Medical School				4 1								1 0			1 0			1 0			5 0	11 0	31
	MISSOURI																							
32	St. Louis University School of Medicine				1 0					2 0			2 0									1 0		32
33	Washington University School of Medicine				0 0					1 0						1 0							2 0	33
	NEBRASKA																							
34	Creighton University School of Medicine		1 0		13 2	1 0	1 0						1 0		5 0	5 0		2 0		1	0	1 0		34
35	University of Nebraska College of Medicine				7 0								1 0			1 0				1	0 1 0			35
	NEW YORK																							
36	Albany Medical College				1 0														1 0					36
37	Columbia University Coll. of Phys. and Surgs.				2 0		3 0				1 0									3 0				37
38	Cornell University Medical College						2 0				1 0											1 0		38
39	Long Island College of Medicine		1 0				1 0														1 0 1 0			39
40	New York Medical College, Flower and Fifth Avenue Hospitals										1 0 1 0								1 0					40
41	New York University College of Medicine				2 0		3 0				1 0									2 0	1 0			41
42	Syracuse University College of Medicine																			1	0			42
43	University of Buffalo School of Medicine										1 0													43
44	Univ. of Rochester Sch. of Med. and Dentistry						2 0				1 0			2 0					1 0		1 0			44
	NORTH CAROLINA																							
45	Duke University School of Medicine										4 0							1 0 1 0			1 0			45
	OHIO																							
46	Ohio State University College of Medicine										1 0			1 0							1 0			46
47	University of Cincinnati College of Medicine										2 0												1 0	47
48	Western Reserve University School of Medicine				1 0						1 0													48
	OKLAHOMA																							
49	University of Oklahoma School of Medicine				3 0																			49
	OREGON																							
50	University of Oregon Medical School					11 0						1 0	1 0							2 0			4 0	50
	PENNSYLVANIA																							
51	Hahnemann Medical Coll. and Hosp. of Phila.				0 1		5 0	2 1	1 0	1 0									4	1	4 0	1 0		51
52	Jefferson Medical College of Philadelphia				7 0		1 0	1 0	1 0	1 0			1 0						1 0		2 0			52
53	Temple University School of Medicine				2 0		2 0	1 0		0 0												1 0		53
54	University of Pennsylvania School of Medicine				2 0		2 1	1 0	1 0		1 0	1 0							1 0				1 0	54
55	University of Pittsburgh School of Medicine																					1 0	1 0	55
56	Woman's Medical College of Pennsylvania																							56
	SOUTH CAROLINA																							
57	Medical College of the State of South Carolina									1 0 1 0													1 0	57
	TENNESSEE																							
58	Meharry Medical College									1 0 1 0										1 0		1 0		58
59	University of Tennessee College of Medicine	1 0			3 0					0 0		1 0												59
60	Vanderbilt University School of Medicine	1 0								2 0			2 0							1 0				60
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	

P = Passed; F = Failed.

| Marginal Number | Alabama | Alaska | Arizona | Arkansas | California | Colorado | Connecticut | Delaware | District of Columbia | Florida | Georgia | Hawaii | Idaho | Illinois | Indiana | Iowa | Kansas | Kentucky | Louisiana | Maine | Maryland | Massachusetts | Michigan | Minnesota | Mississippi | Missouri | Montana | Nebraska | Nevada | New Hampshire | New Jersey | New Mexico | New York | North Carolina | North Dakota | Ohio | Oklahoma | Oregon | Pennsylvania | Rhode Island | South Carolina | South Dakota | Tennessee | Texas | Utah | Vermont | Virginia | Washington | West Virginia | Wisconsin | Wyoming | Alaska, Hawaii and Puerto Rico | Totals | Examined—Passed | Examined—Failed | Percentage—Failed | No. Records Examined in Marginal Number |
|---|---|---

Marginal Number	SCHOOL	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 Dist. Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine	19 Maryland	20 Massachusetts	21 Michigan	22 Minnesota	Marginal Number
		P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	
	TEXAS																							
61	Baylor University College of Medicine	... 1 0	...	...	...	...	...	...	...	1 0	...	...	...	...	...	...	...	...	...	...	...	1 0	... 1	61
62	University of Texas School of Medicine	...	...	...	...	...	...	...	...	1 0	...	...	...	...	...	...	...	...	...	...	...	1 0	1 0	62
	VERMONT																							
63	University of Vermont College of Medicine	...	...	...	...	...	1 1	...	...	...	...	...	...	...	...	...	...	...	1 0	...	0 1	...	1 0	63
	VIRGINIA																							
64	Medical College of Virginia	...	...	...	...	...	...	...	...	1 0	...	...	...	...	...	...	1 0	...	...	1 0	...	1 0	...	64
65	University of Virginia Department of Medicine	...	...	...	...	...	...	...	...	0 1	...	...	...	...	...	...	...	...	...	...	...	1 0	1 0	65
	WISCONSIN																							
66	Marquette University School of Medicine	...	...	...	2 1	...	1 0	...	...	...	...	...	4 0	...	...	...	...	...	...	...	...	2 0	4 0	66
67	University of Wisconsin Medical School	... 1 0	...	...	3 0	...	...	...	...	...	...	...	1 0	...	...	...	3 0	...	...	1 0	...	1 0	3 0	67
	CANADA																							
68	Dalhousie University Faculty of Medicine	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	68
69	Laval University Faculty of Medicine	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1 0	...	...	...	...	69
70	McGill University Faculty of Medicine	...	...	...	20 0	...	1 0	...	...	...	...	...	2 0	...	...	...	...	1 0	1 0	1 0	4 0	2 0	3 0	70
71	Queen's University Faculty of Medicine	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	71
72	University of Alberta Faculty of Medicine	...	...	...	1 0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	72
73	University of Manitoba Faculty of Medicine	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1 0	73
74	University of Montreal Faculty of Medicine	...	...	...	...	...	...	...	...	...	...	...	7 0	...	...	...	...	...	...	...	...	...	...	74
75	University of Toronto Faculty of Medicine	...	...	...	...	...	...	...	...	...	...	...	7 0	...	...	...	...	...	...	...	...	...	...	75
76	University of Western Ontario Medical School	...	...	...	...	...	...	...	...	1 0	...	...	1 0	...	...	...	...	...	...	...	...	...	...	76
77	Foreign Medical Faculties	...	...	...	...	...	3 11	...	...	...	...	0 2	16 3	1 0	1 0	...	...	...	1 1	1 1	9 3	...	...	77
78	Unapproved Schools	... 2 1	...	...	19 3	...	...	...	...	1 0	...	...	50 0	...	...	...	...	...	...	...	80 135	...	...	78
79	Totals	11 9	68	361	68	60	13	31	96	85	16	445	107	100	85	85	149	31	173	287	216	181	79	
80	Totals—Examined—Passed	11 8	68	349	65	44	11	31	92	85	14	442	107	99	85	85	149	29	172	144	216	181	80	
81	Totals—Examined—Failed	0 1	0	12	3	16	2	0	4	0	2	3	0	1	0	0	0	2	1	143	0	0	81	
82	Percentage—Failed	0.0 11.1	0.0	3.3	4.4	26.7	15.4	0.0	4.2	0.0	12.5	0.7	0.0	1.0	0.0	0.0	0.0	6.5	0.6	49.8	0.0	0.0	0.0	82
		1 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22		

P = Passed; F = Failed.

(CONTINUED FROM PAGE 1639)

states. Graduates of the University of California Medical School, University of Georgia School of Medicine, Syracuse University College of Medicine and Woman's Medical College of Pennsylvania were examined in less than five states. Graduates of three

TABLE 5.—*Graduates of Canadian Medical Schools Examined for Licensure in the United States During 1939*

	Examined	Passed	Failed
Alabama	2	2	0
California	23	23	0
Colorado	1	1	0
Connecticut	1	1	0
District of Columbia	2	2	0
Florida	3	2	1
Illinois	14	14	0
Louisiana	1	1	0
Maine	4	4	0
Maryland	1	1	0
Massachusetts	6	6	0
Michigan	2	2	0
Minnesota	8	7	1
Missouri	2	2	0
Montana	1	1	0
New Hampshire	4	4	0
New Jersey	3	3	0
New York	50	42	8
North Dakota	5	5	0
Ohio	4	4	0
Pennsylvania	9	8	1
Rhode Island	1	1	0
Tennessee	2	2	0
Vermont	1	1	0
Virginia	1	1	0
Washington	5	5	0
Totals	156	145	11

of these schools were examined in four states and those from Syracuse University in three.

One hundred and fifty-six graduates of medical schools in Canada took the test for licensure in twenty-six states (table 5).

The greatest number, seventy-two, represented McGill University Faculty of Medicine, who were examined in twenty-two states; thirty-one graduates of the University of Toronto Faculty of Medicine in twelve states, while seventeen from Dalhousie University Faculty of Medicine applied for licensure in only two states. The highest percentage of failures was 40, representing Queen's University Faculty of Medicine; of ten examined, six passed and four failed.

Fifteen medical schools had no failures before state licensing boards, namely the Universities of Colorado, Yale, Indiana, Louisiana State, Michigan, Nebraska, Ohio State, Cincinnati, Western Reserve, Oklahoma, Oregon, Pittsburgh, Vanderbilt, Texas and Wisconsin.

Seven graduates of medical schools now extinct were examined in Florida, Massachusetts and Puerto Rico with 28.6 per cent failures, a total of 1,692 graduates of medical schools other than those in the United States and Canada were examined in twenty-six states, Hawaii and Puerto Rico, while 519 unapproved graduates were examined in fourteen states and Puerto Rico, namely Arizona, Colorado, Connecticut, Florida, Illinois, Massachusetts, New Hampshire, New Jersey, Ohio, Oregon, Pennsylvania, Texas, Virginia and Wyoming.

In 1938, 7,455 were examined, of whom 6,583 passed and 872, 11.7 per cent, failed, as compared with 7,753 examined in 1939, of whom 6,489 passed and 1,264, 16.3 per cent, failed. There were 298 more examined than in 1938; ninety-four fewer passed but the failures increased 392. Elsewhere are given figures representing actual licentiates and additions to the medical profession.

GRADUATES OF 1937, 1938 AND 1939 EXAMINED FOR MEDICAL LICENSURE IN 1939

Figures recording graduates of 1937, 1938 and 1939 examined for medical licensure in 1939 are presented in table 4. Altogether 5,819 were examined, of whom 5,376 passed and 443, 7.6 per cent, failed. Of these, 4,943 represented sixty-seven approved medical schools

Marginal Number	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii and Puerto Rico	Totals	Examined—Passed	Examined—Failed	Percentage—Failed	No. Boards Examined by Marginal Number
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50					
	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F					
61									1	0										68	1								73	72	1	1.4	5 61
62		2	0																	89	0		1	0					95	95	0	0.0	9 62
63									4	2												14	0						25	21	4	16.0	6 63
64							1	0	9	2	5	0			2	0							40	0		6	0		61	59	2	3.3	10 64
65															2	0	1	0					33	0					59	58	1	1.7	6 65
66							1	0	1	3			1	0			1	0			1	0				41	0		68	59	4	6.3	11 66
67	1	0							1	0			2	0			1	0							1	0	1	0	52	52	0	0.0	14 67
68									14	1																			15	14	1	6.7	1 68
69																													1	1	0	0.0	1 69
70		1	0			3	0	2	0				2	0			2	0			1	0			2	0			57	55	2	3.5	17 70
71									1	1																			2	1	1	50.0	1 71
72									1	0																			2	2	0	0.0	2 72
73							1	0					1	0															3	3	0	0.0	3 73
74									1	0																			1	1	0	0.0	1 74
75									5	0			2	0															20	20	0	0.0	5 75
76									6	0			1	0															10	10	0	0.0	5 76
77		2	0				21	14		143	126				5	2				18	3							2	2	410	228	182	44.4	15 77
78						0	1	7	2						36	0		1	0			21	6					0	1	355	206	149	42.0	11 78
79	21	201	9	76	4	13	102	1	850	56	10	316	43	25	530	17	44	8	189	205	17	14	108	43	26	104	6	12	5,819	.....	.....	.....	.. 79
80	21	201	9	76	4	12	155	1	835	56	10	314	43	25	526	17	44	8	189	195	17	14	107	43	26	104	5	10	.....	5,576	.....	.....	.. 80
81	0	0	0	0	0	1	37	0	105	0	0	2	0	0	4	0	0	0	0	10	0	0	1	0	0	0	1	2	.....	443	.....	.....	.. 81
82	0.0	0.0	0.0	0.0	0.0	7.7	10.3	0.0	22.9	0.0	0.0	0.6	0.0	0.0	0.8	0.0	0.0	0.0	0.0	4.9	0.0	0.0	0.9	0.0	0.0	0.0	16.7	16.7	.....	.....	.....	7.6	.. 82
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50					

in the United States, of whom 4,835 passed and 108, 2.2 per cent, failed. One hundred and eleven graduates of nine approved schools in Canada were examined, 107 of whom passed and four, 3.6 per cent, failed. There were 410 recent graduates of medical faculties outside the United States and Canada examined, of whom 228 passed and 182, 44.4 per cent, failed. There were also examined 355 graduates of medical schools not approved by the American Medical Association and graduates of schools of osteopathy, of whom 206 passed and 149, 42 per cent, failed.

TABLE 6.—*Graduates of 1937, 1938 and 1939 Examined for Medical Licensure, 1939*

Graduates of Medical schools in the United States	1937		1938		1939	
	Passed	Failed	Passed	Failed	Passed	Failed
	445	16	1,166	44	3,234	68
Medical schools in Canada	31	1	43	1	33	2
Foreign faculties of medicine	138	108	83	69	9	5
Unapproved schools	35	55	21	42	150	52
Totals	637	180	1,313	156	3,426	107

Of the United States schools 2.2 per cent failed, of the Canadian graduates 3.6 per cent failed and of those educated outside the United States and Canada 44.4 per cent failed. Of the United States graduates the school having the highest percentage of failures, 25, was the University of Buffalo School of Medicine, whose graduates were examined in three states. Sixteen per cent of the graduates of the University of Vermont College of Medicine failed, while 12.5 per cent of the graduates of Albany Medical College failed. More than 10 per cent of the graduates of two other schools, Syracuse University College of Medicine and the Hahnemann Medical College of Philadelphia, failed. Graduates of the first school named failed in three states and the latter in seventeen. Twenty-six schools in the United States had no failures among its recent graduates examined for medical licensure in 1939. Graduates of Rush Medical College and Harvard Medical School were examined in twenty-five states, of Northwestern and Creighton in twenty-four and of Jefferson Medical College in nineteen.

The greatest number examined by any one state was New York, 850; Pennsylvania was second with 530; Illinois examined 445, California 361 and Ohio 316.

More than 100 were examined from eighteen schools, the highest being the 168 graduates of Hahnemann Medical College and Hospital of Philadelphia. Fifty-seven graduates of McGill University Faculty of Medicine were examined in seventeen states, while only one graduate from Laval University and the University of Montreal was examined. Only five graduates of Yale during the years given were examined in four states and thirteen graduates of Duke University School of Medicine were examined in eight states. The majority of the graduates of these two schools obtained the certificate of the National Board of Medical Examiners and received their license to practice by endorsement of this certificate.

The figures shown in the table just described are subdivided by years, giving totals, passed and failed, separately for the graduates of (*a*) medical schools in the United States, (*b*) medical schools in Canada, (*c*) foreign faculties of medicine and (*d*) unapproved medical schools and osteopaths, and included in table 6. Of the 3,533 graduates of approved medical schools in the United States examined in 1939, 107 failed, while 156 of the 1,469 graduates of 1938 failed and 180 of the 817 graduates of 1937 failed. The greatest percentage of failures was among the unapproved graduates.

TABLE 7.—*Credentials Presented by Physicians for Licensure by Reciprocity and Endorsement, 1939*

Marginal Number.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
	Total Licensed	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Gov't Services	National Board of Medical Examiners	U. S. Terr. & Poss.*	Canadian & Foreign	Miscellaneous
Alabama	50	..	..	1	..	..	..	..	..	..	4	..	2	1	..	..	1	5	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arizona	11	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arkansas	22	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
California	241	..	1	3	..	6	1	..	..	1	1	1	21	4	12	12	2	..	1	6	..	2	11	..	3	6	..	22	..	..	2	..	22	2	..	6	6	6	1	1	1	2	6	1	4	2	1	1	4	13	12	4	..	..
Colorado	31	..	..	..	2	..	..	..	..	..	..	..	1	..	1	2	..	..	..	2	1	1	10	..	..	2	..	22	..	..	..	..	1	..	..	2	..	..	1	..	..	..	..	1	..	1	..	..	..	..	..	12	1	..	..
Connecticut	67	..	..	..	4	..	..	..	..	..	..	..	2	..	1	2	..	1	..	1	..	1	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	2	1	..	1	..	3	1	..	17	..	..	..	..
Delaware	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	1	..	13	..	..	2	..	..	1	..	..	..	..	1	..	..	..	..	1	..	..	12	..	..	..	..
Dist. Columbia	55	..	..	..	..	..	..	..	..	2	..	..	..	1	..	..	..	..	1	10	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Florida	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Georgia	36	4	..	..	1	..	..	..	..	..	..	..	..	..	..	2	6	..	..	..	..	..	1	..	..	1	..	..	..	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	12	..	..	..
Idaho	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..	1	1	..	..	..	..	1	..	..	..	..	..	..	..	10	..	..	..	..	..	..	..	..
Illinois	98	..	..	..	1	..	..	..	..	..	..	..	..	1	14	..	2	7	4	..	2	..	..	24	..	..	..	1	..	..	..	..	..	..	..	6	..	..	..	..	..	..	..	2	..	1	..	..	1	..	..	..	..	..	..
Indiana	69	..	..	2	..	..	..	..	..	..	..	..	14	..	4	..	3	7	..	..	..	10	3	..	..	5	..	1	..	..	..	..	2	..	..	6	..	..	4	..	..	..	..	2	..	1	..	..	4	..	1	11	..	..	..
Iowa	69	..	..	1	1	..	..	..	..	..	..	..	6	..	1	2	1	1	..	..	..	4	10	..	..	6	..	14	..	..	1	..	2	..	..	1	..	..	2	..	..	..	..	1	..	1	..	..	1	..	..	9	..	..	..
Kansas	24	..	..	2	..	..	..	..	..	..	1	..	6	..	..	5	2	1	..	..	..	4	10	..	..	1	..	..	..	..	1	..	2	..	..	1	..	..	1	..	..	..	..	1	..	1	..	..	1	..	..	1	..	..	..
Kentucky	57	1	..	..	..	..	..	..	..	..	3	..	4	1	1	..	..	2	..	1	..	1	..	6	..	2	..	1	..	..	..	..	2	..	..	1	..	..	2	..	..	..	..	2	..	1	..	..	1	..	..	2	..	..	..
Louisiana	21	1	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	1	2	4	..	1	..	1	..	..	..	..	..	..	11	1	..	..	..	..	..	..	..	10	..	1	1	1	2	..	..	1	..	..	..
Maine	16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	2	..	1	..	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	5	6	..	..	..	1	..	..	1	..	..	..
Maryland	55	..	..	..	2	..	..	..	4	..	..	..	2	..	1	..	..	1	..	..	..	1	1	..	..	1	..	2	..	..	2	2	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Massachusetts	101	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	..	1	..	..	..	1	1	..	..	1	..	2	..	..	1	..	5	..	..	2	..	..	1	7	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..
Michigan	144	1	..	2	6	2	1	..	..	..	1	..	21	4	11	6	4	2	1	4	..	2	..	..	..	..	..	4	..	..	2	1	1	5	..	1	13	2	..	9	..	..	..	..	..	..	..	..	..	..	6	16	..	..	..
Minnesota	27	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	1	1	1	..	2	..	..	..	1	..	1	..	..	..	..	1	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	101	..	..	..
Mississippi	15	2	..	1	1	..	..	..	..	..	3	..	1	..	..	1	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	13	..	..	..
Missouri	75	..	..	2	7	..	..	..	..	..	1	..	8	..	9	..	1	3	..	2	..	1	..	1	..	..	..	6	..	..	1	1	2	..	..	1	..	..	1	..	..	..	..	1	..	2	..	..	1	..	..	9	..	..	..
Montana	19	..	..	..	1	1	..	..	..	..	..	..	1	1	1	..	..	..	..	..	..	2	..	..	..	1	..	1	..	..	1	1	..	..	1	..	..	1	..	..	..	..	..	..	12	..	..	..	..	..	1	..	..	..
Nebraska	16	..	..	..	1	1	..	..	..	..	..	..	1	..	2	..	..	..	..	1	..	1	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	1	..	..	..	..	..	..	1	1	..	1	..	..	10	..	..	..
Nevada	11	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	1	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..
New Hampshire	29	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	2	6	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..
New Jersey	161	..	..	..	..	..	..	..	..	1	..	..	2	..	1	..	..	2	6	..	..	1	1	12	..	..	..	1	..	..	..	..	3	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..
New Mexico	47	..	..	3	2	1	..	..	..	..	3	..	2	1	1	1	2	1	4	2	..	1	1	12	4	2	..	5	..	..	..	..	..	..	..	6	..	..	16	..	..	..	..	1	..	1	..	..	..	..	..	11	..	..	..
New York	415	2	..	..	10	..	..	2	..	1	..	2	8	3	1	1	1	1	25	2	..	5	1	1	..	1	..	3	..	..	..	..	4	1	..	3	..	..	3	..	..	..	..	2	..	1	..	..	..	..	..	25	..	..	..
North Carolina	68	..	..	1	1	..	..	..	..	..	6	..	2	..	2	1	1	4	..	5	..	..	3	..	..	1	..	1	..	..	..	26	..	2	31	..	1	1	9	..	..	..	22	9	..	..	1	15	..	..	1	..	..	..
North Dakota	9	..	..	..	1	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	3	9	..	..	..	2	..	..	210	..	..	..
Ohio	119	..	..	..	..	1	..	..	..	5	..	..	2	4	2	3	6	2	1	10	..	2	1	..	..	..	..	4	..	..	..	..	..	..	31	1	..	1	8	..	..	..	5	5	..	..	1	12	..	1	12	..	1	..
Oklahoma	37	..	..	6	..	..	..	..	..	..	2	..	2	1	..	2	1	1	..	2	..	12	1	..	..	14	..	4	..	..	..	..	15	1	..	1	1	1	13	..	..	..	3	..	..	..	2	1	..	..	6	..	..	..
Oregon	28	..	..	..	1	1	..	..	..	1	..	..	1	..	2	..	1	1	..	1	..	1	1	..	..	6	..	1	..	..	..	..	1	..	1	..	..	..	..	..	..	..	6	5	..	..	1	..	2	1	1	..	..	..
Pennsylvania	63	..	..	..	1	..	..	1	..	..	..	1	1	1	..	..	..	1	..	6	..	1	1	..	..	2	..	1	..	..	..	..	5	..	..	3	..	..	1	..	..	..	..	2	1	..	..	1	2	..	1	1	..	..	..
Rhode Island	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	2	1	..	..	..	1	3	..	..	..	..	..
South Carolina	12	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	23	..	..	..
South Dakota	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14	..	..	..
Tennessee	38	1	..	2	..	..	..	..	1	..	3	..	1	..	2	4	..	..	..	3	..	..	1	..	..	..	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Texas	159	1	..	8	4	3	1	..	..	..	1	..	9	2	3	5	2	12	..	2	..	2	1	3	..	8	..	4	..	..	1	1	11	1	..	10	6	..	2	..	2	..	..	17	..	..	3	1	2	..	..	..	..	..
Utah	28	..	..	..	1	..	..	..	..	..	..	..	1	..	1	..	3	..	..	..	..	4	12	3	..	3	..	4	..	..	..	..	2	..	..	1	1	..	1	..	..	..	..	..	..	..	..	1	..	..	2	..	..	..	..
Vermont	10	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	1	1	..	..	..	..	4	..	..	..	..	1	..	..	2	1	..	..	..	..	..	..	..	..	2	..	..	..	2	..	..	..	..	..
Virginia	66	..	..	1	..	1	..	..	5	..	..	..	2	..	..	..	5	..	1	10	..	..	..	..	..	1	..	1	..	..	..	..	5	1	..	1	..	..	1	..	..	..	..	1	..	1	..	..	1	..	..	2	..	..	..
Washington	47	..	..	..	6	1	..	..	..	..	..	..	2	..	1	..	2	..	..	..	..	5	1	..	..	1	..	4	..	..	1	1	1	..	3	..	..	6	..	1	1	6	..	..	..	..	3	1	..	4	3	..	3	5	1	..
West Virginia	30	..	..	1	..	..	..	..	..	2	..	3	..	1	..	3	1	1	3	..	..	4	1	3	..	..	..	4	..	..	..	..	..	..	..	1	6	1	..	..	..	2	1	..	..	1	..	..	..	..	14	..	..	..
Wisconsin	61	..	1	..	1	..	..	..	..	1	..	16	1	5	..	..	1	..	..	3	..	6	4	..	3	..	..	1	..	..	..	..	3	..	..	9	..	..	1	..	..	..	3	5	..	..	11	..	1	..	4	..	..	..
Wyoming	10	..	..	..	1	1	..	..	..	..	..	..	1	..	1	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1	..	6	2	1	4	..	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..
U. S. Territories & Possessions*	19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..
Totals	2,866	13	1	36	30	25	10	1	13	1	41	1	139	34	87	52	54	60	10	132	14	85	62	18	115	3	85	0	6	55	3	195	20	3	133	25	19	112	3	12	6	164	54	5	6	26	9	28	42	1	21	667	3	6	5
Marginal Number.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54

* Alaska, the Canal Zone, Hawaii, Puerto Rico and Virgin Islands.

In the following tabulation is recorded the number of graduates of 1937, 1938 and 1939, respectively, examined and the results:

Graduates of	Examined	Passed	Percentage Failed
1937	817	637	22.0
1938	1,469	1,313	10.6
1939	3,583	3,476	3.0

FAILURES BEFORE MEDICAL LICENSING BOARDS BY LICENTIATES OF 1939

In table 8 are presented for each state the number of candidates examined or granted licenses by endorsement or reciprocity and the number licensed after one failure and after two or more failures, these two groups being classified by indication whether the failure or failures have been in the state in which they are receiving a license or elsewhere and also if the failure has been in the state where licensed and elsewhere.

Of the total number examined and endorsed, 9,260, 529 failed, 275 after one examination in the state in which they were licensed in 1939 and seventy elsewhere, while 116 failed more than once in the state awarding the 1939 license, nineteen elsewhere, and forty-nine failed in the state where licensed in 1939 and also elsewhere.

In the computation of this table it was noted that of graduates of unapproved schools licensed in Massachusetts one failed eleven times in the state, one had nine failures, two had seven failures before successfully passing, and two failed eight times, three six times and one five times. Two graduates of faculties of medicine abroad were examined unsuccessfully in Massachusetts five and seven times, respectively, before obtaining a license. A candidate had six failures in California and then secured a license. Another made six unsuccessful attempts in New York. He was a foreign graduate. Five others failed five or more times in New York and elsewhere before receiving a New York license. These five were also graduates from abroad. Two others failed five and six times and then secured licensure in Ohio and New Hampshire, respectively.

Eighteen states licensed physicians in 1939 who never failed a state board examination, while New York licensed 252, New Jersey eighty-two and Massachusetts seventy-one who previously failed. Licensure with failures occurred in thirty-one states and Puerto Rico but, with the exception of Massachusetts, New Jersey and New York, no state licensed more than fifteen.

REGISTRATION BY RECIPROCITY AND ENDORSEMENT

The number of physicians granted licenses to practice medicine and surgery without examination on presentation of satisfactory credentials is given in table 7. There were 2,846 so registered who presented licenses from other states, Canada and foreign countries, the certificate of the National Board of Medical Examiners, one of the government services, or other credentials.

Definite reciprocal relations are reported by twenty-five states. Twenty-five states, including five that have regularly established reciprocal relations, will register licentiates who present credentials which correspond to those required by their respective states at the time such licenses were issued. The medical practice acts of many give the examining board the privilege of using its discretion in determining the acceptability of a candidate. The reciprocity and endorsement policies of the various states, the District of Columbia, Alaska, Hawaii and Puerto Rico are presented in table 9. In addition there is also indicated whether licenses are granted to diplomates of the National Board of Medical Examiners or to retired officers of the government services. Specific requirements such as professional practice, basic science certificate, oral examination and internship are recorded, as is also the fee demanded. Florida, Idaho, Massachusetts, Rhode Island and Hawaii do not have reciprocal or endorsement arrangements with any state. Massachusetts, Rhode Island and Hawaii, however, will register diplomates of the National Board of Medical Examiners by endorsement. Those desiring licenses by reciprocity or endorsement in Arizona, Arkansas, Colorado, Connecticut, the District of Columbia, Florida, Iowa, Michigan, Minnesota, Nebraska, Oklahoma, Oregon, South Dakota, Washington and Wisconsin are required to obtain a certificate from the board of examiners in the basic sciences before being eligible for licensure. Other requirements or exemptions are mentioned in the footnotes. Some states also have additional requirements for graduates of schools outside the United States and Canada.

It will be noted in table 7 that New York granted the greatest number of licenses by endorsement in 1939

TABLE 8.—*Failures Before Medical Licensing Boards by Licentiates of 1939*

	Licenses Issued by Examination, Reciprocity or Endorsement	Licensed after One Failure		Licensed after Two or More Failures		
		Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed	Elsewhere	Failed in State Where Licensed and Elsewhere
Alabama	57	..	1	..	..	..
Arizona	22	.	1	..	..	..
Arkansas	30	..	..	..	1	..
California	625	10	1	2	..	2
Colorado	100	2	..	..	..	..
Connecticut	120	4	..	2	..	1
Delaware	14	..	..	..	1	..
Dist. of Columbia	109	..	..	..	1	1
Florida	172	5	2	1	..	..
Georgia	128	..	3	..	..	..
Idaho	24	..	..	..	..	..
Illinois	612	8	1	2	..	..
Indiana	182	1	1	..	..	..
Iowa	165	1	1	..	..	..
Kansas	110	..	..	..	..	..
Kentucky	142	..	..	..	..	..
Louisiana	94	..	..	..	..	..
Maine	58	..	2	..	..	1
Maryland	241	4	2	1	..	1
Massachusetts	378	17	7	61	4	..
Michigan	382	..	..	..	..	..
Minnesota	244	1	..	..	..	..
Mississippi	57	..	1	..	1	..
Missouri	280	..	..	..	..	..
Montana	30	..	..	..	..	..
Nebraska	94	..	..	..	..	..
Nevada	15	..	..	..	..	..
New Hampshire	38	..	3	..	2	..
New Jersey	250	65	13	1	5	10
New Mexico	49	..	1	..	..	..
New York	1,439	137	6	61	1	25
North Carolina	185	..	..	..	1	..
North Dakota	38	..	..	..	..	..
Ohio	480	6	3	..	..	1
Oklahoma	79	..	..	..	..	..
Oregon	55	..	1	..	..	..
Pennsylvania	617	6	3	..	..	..
Rhode Island	30	..	..	1	1	..
South Carolina	60	..	..	..	..	..
South Dakota	18	..	..	..	..	..
Tennessee	211	..	2	..	..	..
Texas	384	4	6	2	..	1
Utah	45	..	..	..	..	..
Vermont	34	..	..	..	..	..
Virginia	179	..	..	..	..	..
Washington	106	..	..	..	..	..
West Virginia	92	..	1	..	1	..
Wisconsin	177	..	..	..	..	..
Wyoming	20	..	1	..	..	..
U. S. Terr. and Possessions	49	3	1	..	..	..
Totals	9,260	275	70	116	19	49

(415), California the second highest, 241, New Jersey 161, Texas 159, Michigan 144, Ohio 119 and Massachusetts 101. All other states licensed fewer than 100 by this method. The largest group representing the same type of credentials were the 667 diplomates of the National Board of Medical Examiners. More than 100 presented licenses issued in twenty-five states and the National Board. The number of physicians registered in New York on the basis of foreign credentials was only three; it was twenty-one in 1938 and 146 in 1937. In 1938 the New York Board of Regents ruled that all would be required henceforth to pass an examina-

TABLE 9.—*Reciprocity and*

Compilation of data furnished by state examining boards. This information is not guaranteed, as there may have been

Marginal Number	The Examining Board of	Reciprocates with, or Endorses Certificates Granted by: Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	Marginal Number
1	Alabama	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
2	Arizona	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
3	Arkansas (regular board)	+	+	..	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	..	+	+	3
4	California	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
5	Colorado	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6	Connecticut (regular board)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6
7	Delaware (regular board)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	District of Columbia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Florida	No reciprocity or endorsement policies																														9
10	Georgia	+	..	+	..	..	..	..	+	..	..	..	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	10
11	Idaho	No reciprocity or endorsement policies																														11
12	Illinois	+	..	+	+	+	..	..	+	..	+	..	..	+	+	+	+	+	+	..	+	+	+	+	+	..	+	+	..	+	..	..	12
13	Indiana	+	..	+	+	+	..	..	+	..	+	..	+[12]	..	+	+	+	+	+	..	+	+	+	+	+	..	+	+	..	+	+	..	13
14	Iowa	+	..	+	+	+	..	..	+	..	+	..	+	+	..	+	+	+	+	..	+	+	+	+	+	..	+	+	..	+	+	..	14
15	Kansas	+	+	+[19]	+	+	..	..	+	..	+	..	+	+	+	..	+	+	+	..	+	+	+	+	+	..	+	+	..	+	+	..	15
16	Kentucky	+	..	+	+	+	..	..	+	..	+	..	+	+	+	+	..	+	..	..	+	+	+	+	+	..	+	+	..	+	+	..	16
17	Louisiana (regular board)	+	+	+	+	+	..	..	+	..	+	..	+	+	+	+	+	..	..	..	+	+	+	+	+	..	+	+	..	+	+	..	17
18	Maine	..	..	+	+	+	..	..	+	..	+	..	+	+	+	+	+	+	..	..	+	..	+	+	+	..	+	+	..	+	+	..	18
19	Maryland (regular board)	..	..	+	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	..	..	+	+	+	+	+	..	+	+	..	+	+	..	19
20	Massachusetts	No reciprocal relations																														20
21	Michigan	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	..	+	..	..	+	+	..	+	+	..	+	+	..	21
22	Minnesota	+	..	+	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	..	+	..	+	..	+	..	+	+	..	+	+	..	22
23	Mississippi	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	..	+	+	+	+	..	..	+	+	..	+	+	..	23
24	Missouri	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	24
25	Montana	+	+	+	+	+	..	+	+	..	+	..	+	+	+	..	+	+	+	..	+	+	+	+	+	..	..	..	..	+	+	..	25
26	Nebraska	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	26
27	Nevada	..	..	+[21]	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	+	+	..	+	+	..	27
28	New Hampshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28
29	New Jersey	+	..	..	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	..	+	+	+	..	+	..	+	+	..	+	..	..	29
30	New Mexico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30
31	New York	+	..	..	+	..	..	..	+	..	+	..	+	+	..	..	..	..	+	..	+	..	+	..	+	..	..	+	..	..	..	..	31
32	North Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	32
33	North Dakota	+	..	+	+	+	..	..	..	..	+	..	+	+	+	+	+	+	..	..	+	..	..	+	+	..	+	+	..	+	+	..	33
34	Ohio	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	..	..	+	..	..	+	+	..	+	+	..	+	+	..	34
35	Oklahoma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35
36	Oregon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	36
37	Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37
38	Rhode Island	No reciprocal relations																														38
39	South Carolina	+	..	..	..	..	..	..	+	..	+	..	..	..	..	..	..	..	+	+	+	..	..	..	..	..	..	..	..	..	+	..	39
40	South Dakota	+	+	+	+	+	..	..	+	..	+	..	+	+	+	+	+	+	+	..	+	..	+	+	+	..	+	+	..	+	+	..	40
41	Tennessee	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	+	+	..	+	+	..	41
42	Texas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	42
43	Utah	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	43
44	Vermont	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44
45	Virginia	+	..	+	+	..	..	..	+	..	+	..	+	+	+	+	+	+	+	..	+	..	+	+	+	..	+	+	..	+	+	..	45
46	Washington	+	..	..	+	+	..	..	..	..	+	..	..	+	..	+	+	+	+	..	+	+	+	+	+	..	..	..	..	..	..	..	46
47	West Virginia	+	..	+	..	..	..	..	+	..	+	..	+	+	+	+	+	+	+	..	+	+	+	+	+	..	+	+	..	+	+	..	47
48	Wisconsin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	48
49	Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
50	Alaska	..	..	+	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50
51	Hawaii	No reciprocal relations																														51
52	Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52

Some states have additional requirements for graduates of schools outside the United States and Canada.

1. 1st P, first papers required; +, full citizenship required.
2. In most cases there is a small additional recording or registration fee.
3. If state of original license grants similar privileges.
4. Internship accepted in lieu of one year's practice.
5. Professional practice required.
6. No professional practice required.
7. Just preceding application.
8. No basic science reciprocity—examination must be within the state.
9. Basic science certificate required either by reciprocity or examination in addition to basic science subjects of National Board.
10. Reserve officers not eligible.
11. Applicant's diplomate certificate must be dated not less than one year prior to the filing date in California of an application; applicant must also have been a resident of some state or territory of the United States for a period of at least one year after the date of his diplomate certificate.
12. Oral examination required when original license is ten or more years old.
13. Applicant must have resided in the state used as basis of application for one year after date on said certificate.
14. Oral examination required.
15. Unless in practice in another state for five years.
16. Actual practice for a period of three years immediately preceding date of application.
17. Practical, clinical examination required.
19. Regular and Homeopathic boards.
20. Required of graduates of foreign medical schools.

physicians holding licenses in Illinois, Maryland, Missouri, New York, Ohio, Pennsylvania and Tennessee, respectively, were licensed in the various states. Only 195 physicians with New York licenses secured certificates elsewhere, while 415 were registered in New York on the basis of credentials. These 415 physicians

tion. This decision was appealed but the position of the regents was supported by the Appellate Division of the Supreme Court.

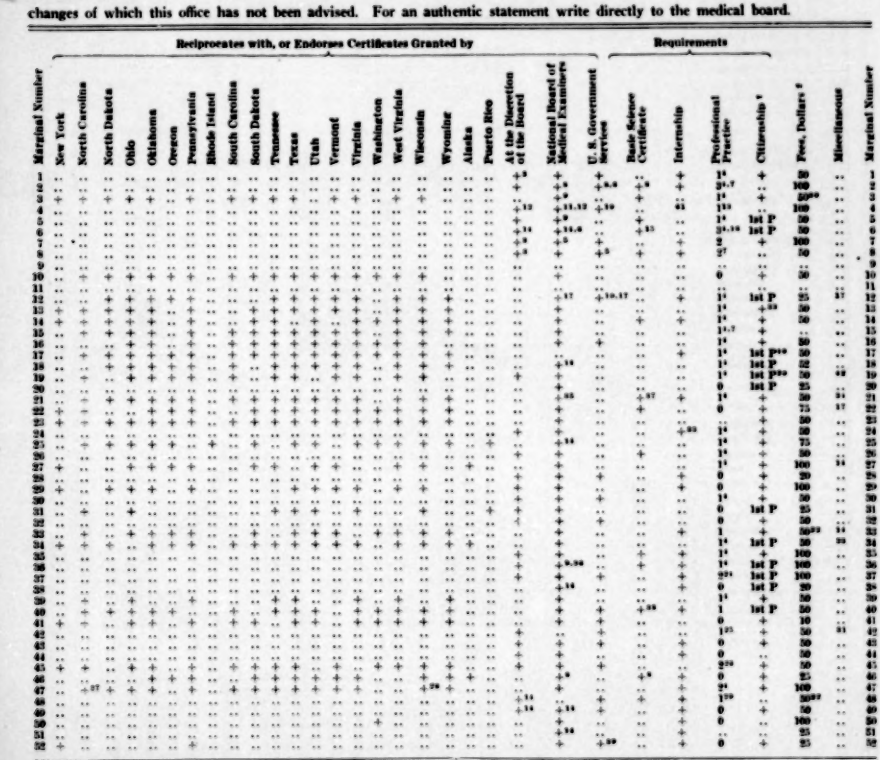
One physician in New Hampshire was licensed on the basis of credentials from Greece. Of the three in New York, licenses were presented from Ontario,

Austria and the Union of Socialist Soviet Republics. In North Carolina one was registered by endorsement of a license from Nova Scotia and one in Virginia on the basis of an Australian license. Altogether, six physicians were licensed on the basis of Canadian and foreign credentials in four states.

holding credentials from the U. S. Navy were given the right to practice without the requirement of an examination, as follows: California licensed eleven, Texas one, Virginia three and Wisconsin one. Two, one in California and in Texas, respectively, were certified on credentials from the U. S. Army and three,

Endorsement Policies

changes of which this office has not been advised. For an authentic statement write directly to the medical board.



21. Regular board.
22. Fee same as applicant's state charges if more than $50.
23. Oral examination required if applicant's state requires it.
24. If an applicant passes the examination in the state from which he transfers after the completion of his internship, no practice is required.
25. Internship accepted if served in this state.
26. Internship accepted—considered equivalent to two years' practice.
27. Five years' practice.
28. Conditionally.
29. A two year internship is accepted.
30. License by National Board certificate at examination fee of $15 unless holding a license from another state.
31. Graduates before 1907 required to take oral examination.
32. Clinical examination required.
33. Reciprocity applicants only.
34. Supplemental examination required in certain cases when accepting the examination of a state with whom reciprocal relations have not been established.
35. May be licensed after a special (written) supplemental examination.
36. Fee for license on basis of National Board certificate $25.
37. For matriculants after Oct. 17, 1937.
38. After July 1, 1939.
39. While on active duty only.
40. Permanent license withheld until completion of citizenship.
41. Graduates of foreign medical schools effective Sept. 15, 1925. Canadian schools exempted effective Sept. 19, 1930.
42. Graduates of foreign medical schools are not accepted by reciprocity.

One state accepted credentials from Alaska and one endorsed two licenses issued in Puerto Rico. In addition, three were admitted to private practice in the Virgin Islands and two in the Canal Zone.

Twenty-one physicians were registered on the basis of commissions in the government services. Sixteen in California, Illinois and North Carolina, by endorsement of connections with the United States Public Health Service.

Not included in the table are twenty osteopaths licensed by the board of medical examiners in three

(CONTINUED ON PAGE 1650)

TABLE 10.—*Candidates Licensed by Reciprocity and Endorsement, 1939*

Marginal Number	SCHOOL	1 Alabama	2 Arizona	3 Arkansas	4 California	5 Colorado	6 Connecticut	7 Delaware	8 District of Columbia	9 Florida	10 Georgia	11 Idaho	12 Illinois	13 Indiana	14 Iowa	15 Kansas	16 Kentucky	17 Louisiana	18 Maine	19 Maryland	20 Massachusetts	21 Michigan	22 Minnesota	23 Mississippi	24 Missouri	25 Montana	26 Nebraska	27 Nevada	28 New Hampshire	29 New Jersey	30 New Mexico	31 New York	32 North Carolina	33 North Dakota	34 Ohio	35 Oklahoma	36 Oregon	37 Pennsylvania	38 Rhode Island	39 South Carolina	40 South Dakota	41 Tennessee	42 Texas	43 Utah	44 Vermont	45 Virginia	46 Washington	47 West Virginia	48 Wisconsin	49 Wyoming	50 U. S. Terr & Poss.*	Totals	Marginal Number
	ARKANSAS																																																				
1	University of Arkansas School of Medicine	1	..	1	4	..	..	..	..	..	..	..	..	2	..	3	..	1	..	..	3	..	1	3	..	..	..	..	..	1	1	1	..	..	6	..	..	..	..	..	2	5	..	..	1	..	2	..	..	..	..	38	1
	CALIFORNIA																																																				
2	College of Medical Evangelists	..	..	..	9	4	..	..	1	..	..	..	1	..	3	..	1	..	..	..	5	3	6	..	..	..	1	..	1	..	1	2	8	2	1	..	..	4	..	..	..	..	..	5	1	..	6	..	1	3	..	69	2
3	Stanford University School of Medicine	..	..	..	3	..	1	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	1	1	..	..	..	..	2	1	..	..	..	..	..	..	..	3	..	..	..	1	17	3
4	University of California Medical School	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	8	4
5	University of Southern California School of Medicine	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	5
	COLORADO																																																			
6	University of Colorado School of Medicine	..	..	..	5	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	1	3	1	1	..	..	..	2	..	..	..	..	..	1	..	..	..	..	..	3	..	..	1	2	..	..	1	..	24	6
	CONNECTICUT																																																			
7	Yale University School of Medicine	..	..	..	3	..	14	..	..	..	..	..	1	..	1	..	..	..	1	..	6	1	..	..	..	..	1	..	1	2	2	21	..	..	1	..	..	3	3	..	..	..	3	..	1	..	..	..	..	..	..	2	67	7
	DISTRICT OF COLUMBIA																																																			
8	George Washington University School of Medicine	..	..	..	2	..	1	1	10	..	..	..	..	..	..	..	1	..	..	4	1	1	1	..	..	..	..	..	..	..	1	5	..	..	1	..	1	..	..	..	1	1	..	..	3	..	1	..	..	1	37	8
9	Georgetown University School of Medicine	..	..	..	..	2	..	9	..	..	..	..	..	..	..	..	..	..	..	4	3	1	..	1	1	..	..	..	1	2	..	24	1	..	1	..	2	1	..	..	..	..	..	..	3	1	..	..	..	..	57	9
10	Howard University College of Medicine	..	..	..	1	..	..	8	..	2	..	..	..	..	..	..	1	..	..	..	..	3	..	1	..	..	..	..	..	2	..	3	2	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	25	10
	GEORGIA																																																			
11	Emory University School of Medicine	2	..	..	..	..	..	..	1	..	1	..	..	..	..	..	1	..	..	..	..	..	3	..	..	..	..	..	..	..	..	1	2	..	4	..	..	..	1	..	1	2	..	..	..	..	..	2	..	..	1	23	11
12	University of Georgia School of Medicine	..	..	1	1	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	1	..	..	..	..	..	..	..	..	3	..	1	2	..	1	..	..	..	1	..	1	..	..	..	..	..	1	1	..	..	..	15	12
	ILLINOIS																																																			
13	Loyola University School of Medicine	..	..	1	..	..	..	..	..	..	..	..	3	4	1	..	..	..	..	1	..	9	1	..	1	..	..	..	..	..	1	4	..	1	2	..	..	..	..	..	..	..	3	1	..	..	..	..	3	..	..	..	30	13
14	Northwestern University Medical School	..	..	..	6	2	..	2	..	2	..	..	5	3	2	1	..	..	..	2	..	7	4	..	3	..	3	2	..	..	1	5	1	..	2	..	1	..	..	..	..	1	4	1	1	2	3	3	6	..	1	78	14
15	University of Chicago, Rush Medical College	3	..	..	10	2	..	..	..	..	..	..	2	1	3	..	2	..	..	2	2	7	2	..	4	2	..	..	..	..	3	8	2	1	4	2	..	2	..	..	1	..	5	2	..	1	3	3	3	..	..	82	15
16	University of Chicago, The School of Medicine	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..	4	..	..	1	..	1	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	14	16
17	University of Illinois College of Medicine	..	..	..	3	..	..	..	..	..	1	..	2	6	1	1	1	..	..	..	..	3	..	1	3	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	2	3	1	..	..	..	..	2	..	..	..	34	17
	INDIANA																																																			
18	Indiana University School of Medicine	..	..	..	4	..	..	..	..	..	..	..	1	1	1	1	1	..	..	..	..	4	..	..	1	..	..	..	..	..	2	1	8	..	..	1	..	..	1	..	..	..	..	3	..	..	..	..	..	1	..	..	31	18
	IOWA																																																			
19	State University of Iowa College of Medicine	..	1	2	10	1	1	..	..	..	..	..	10	3	..	..	2	..	..	..	..	11	3	..	2	..	2	1	1	1	2	2	..	3	..	2	..	..	..	1	..	3	1	..	..	1	..	5	..	..	..	74	19
	KANSAS																																																			
20	University of Kansas School of Medicine	..	..	..	7	2	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	4	..	..	6	1	2	..	..	..	1	1	1	..	3	..	..	..	..	..	..	1	4	..	..	..	..	..	..	..	2	..	40	20
	KENTUCKY																																																			
21	University of Louisville School of Medicine	1	..	..	1	..	..	..	..	..	2	..	2	6	3	..	3	..	..	..	..	4	..	1	..	..	..	..	..	..	4	1	2	1	..	5	2	1	..	..	1	..	2	1	3	..	5	2	2	..	..	57	21
	LOUISIANA																																																			
22	Louisiana State University School of Medicine	2	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	1	7	..	..	..	..	..	..	..	..	..	18	22
23	Tulane University of Louisiana School of Medicine	4	1	7	3	1	..	..	..	..	7	..	..	..	1	2	1	..	..	..	..	1	..	4	1	..	..	1	..	..	1	1	4	..	2	..	1	..	..	..	2	19	..	..	..	..	..	..	..	1	1	64	23
	MARYLAND																																																			
24	Johns Hopkins University School of Medicine	1	..	..	5	1	5	..	3	..	..	..	1	..	..	..	1	..	..	4	..	4	2	..	2	..	..	..	1	2	..	16	3	..	6	1	..	4	1	1	..	2	5	..	..	3	1	1	..	..	1	77	24
25	University of Maryland School of Medicine and College of Physicians and Surgeons	1	..	..	3	..	1	1	5	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	1	17	2	..	..	..	..	1	..	..	..	1	..	..	1	..	7	..	2	..	..	47	25
	MASSACHUSETTS																																																			
26	Boston University School of Medicine	..	..	..	1	1	1	..	1	..	..	..	..	..	..	..	1	..	..	..	16	1	..	..	..	..	..	..	..	2	2	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	36	26
27	Harvard Medical School	1	..	..	6	1	5	..	..	..	..	..	1	..	..	1	3	..	2	2	21	3	..	1	..	2	..	..	6	1	..	21	2	1	5	1	3	1	1	..	..	1	2	1	2	3	1	1	..	..	109	27
28	Tufts College Medical School	1	..	..	..	1	6	..	1	..	..	..	..	..	..	..	2	1	2	..	22	2	..	..	..	..	..	..	3	1	..	9	..	..	..	..	..	..	3	..	..	..	1	1	..	1	1	..	..	..	..	60	28
	MICHIGAN																																																			
29	University of Michigan Medical School	..	1	..	7	2	..	..	1	..	1	..	5	3	4	1	..	1	..	1	..	1	1	..	1	..	2	..	..	6	..	3	..	9	1	..	1	..	..	1	1	..	..	..	1	6	..	1	62	29
30	Wayne University College of Medicine	..	..	..	4	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	..	..	..	..	1	1	..	..	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	30
	MINNESOTA																																																			
31	University of Minnesota Medical School	..	..	..	10	..	..	..	..	..	..	..	2	..	5	1	..	1	..	1	1	2	1	1	..	1	..	..	..	..	1	5	..	1	..	1	1	..	..	1	1	..	6	..	..	2	..	4	..	..	..	50	31
	MISSOURI																																																			
32	St. Louis University School of Medicine	..	2	..	4	2	2	..	..	..	..	..	16	3	4	3	1	2	..	..	..	1	..	..	4	1	..	..	..	..	4	..	16	..	..	11	..	..	1	..	..	..	..	3	..	..	..	1	2	..	1	..	86	32
33	Washington University School of Medicine	3	..	2	8	1	..	..	1	..	..	..	9	2	2	2	..	..	..	..	..	1	1	..	1	..	1	1	..	..	1	2	..	1	5	2	1	..	..	..	..	..	2	..	..	1	2	3	1	..	..	56	33

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(CONTINUED FROM PAGE 1647)

states, namely one in Oregon and two in Wyoming licensed to practice osteopathy and surgery and seventeen in Texas granted the right to practice medicine and surgery.

Of the five homeopathic boards in existence—Arkansas, Connecticut, Delaware, Louisiana and Maryland—only two issued licenses by endorsement, Louisiana and Maryland, which licensed one each. The Eclectic Board in Arkansas did not register any one.

TABLE 11.—*Licentiates Representing Additions to the Medical Profession, 1935-1939*

Year	Examination	Reciprocity and Endorsement	Total
1935	5,099	411	5,510
1936	5,547	628	6,175
1937	5,812	658	6,470
1938	5,756	497	6,253
1939	5,583	460	6,043
Totals	27,797	2,604	30,401

TABLE 12.—*Licentiates Representing Additions to the Medical Profession, 1939*

	Examination	Reciprocity and Endorsement	Total
Alabama	4	4	8
Arizona	4	..	4
Arkansas	68	1	69
California	340	11	351
Colorado	66	4	70
Connecticut	36	22	58
Delaware	8	..	8
District of Columbia	30	16	46
Florida	38	..	38
Georgia	86	1	87
Idaho	2	..	2
Illinois	478	7	485
Indiana	112	1	113
Iowa	85	1	86
Kansas	83	1	84
Kentucky	85	2	87
Louisiana	68	..	68
Maine	31	2	33
Maryland	180	11	191
Massachusetts	202	78	280
Michigan	224	10	234
Minnesota	147	7	154
Mississippi	22	..	22
Missouri	203	7	210
Montana	6	1	7
Nebraska	78	1	79
Nevada	3	..	3
New Hampshire	7	7	14
New Jersey	202	8	210
New Mexico	2	3	5
New York	982	180	1,162
North Carolina	57	8	65
North Dakota	7	..	7
Ohio	354	3	357
Oklahoma	36	..	36
Oregon	23	6	29
Pennsylvania	468	8	476
Rhode Island	16	8	24
South Carolina	43	..	43
South Dakota	6	..	6
Tennessee	178	1	179
Texas	196	15	211
Utah	16	1	17
Vermont	16	1	17
Virginia	110	7	117
Washington	45	5	50
West Virginia	15	2	17
Wisconsin	105	2	107
Wyoming	2	1	3
U. S. Territories and Possessions *	8	6	14
Totals	5,583	460	6,043

* Canal Zone, Hawaii and Puerto Rico.

Diplomates of the National Board of Medical Examiners were registered in forty-two states and in Hawaii.

New York had the greatest number of its licentiates registered in any state, sixty-eight, who were given the right to practice in New Jersey. Arizona, Delaware, Florida, Idaho, Montana, New Hampshire, New Mexico, North Dakota, Rhode Island, South Dakota, Utah, Vermont, Washington and Wyoming had less than ten of their licentiates endorsed to other states. Nevada had no physicians endorsed.

Delaware, Florida, Idaho and Wyoming had only one endorsed, and Arizona, Montana, New Mexico, North Dakota and Rhode Island had three each.

TABLE 13.—*Licentiates Representing Additions to the Medical Profession Grouped in Geographic Divisions, 1939*

	Examination	Reciprocity and Endorsement	Total
New England			
Maine	31	2	33
New Hampshire	7	7	14
Vermont	16	1	17
Massachusetts	202	78	280
Rhode Island	16	8	24
Connecticut	36	22	58
	308	118	426
Middle Atlantic			
New York	982	180	1,162
New Jersey	202	8	210
Pennsylvania	468	8	476
	1,652	196	1,848
East North Central			
Ohio	354	3	357
Indiana	112	1	113
Illinois	478	7	485
Michigan	224	10	234
Wisconsin	105	2	107
	1,273	23	1,296
West North Central			
Minnesota	147	7	154
Iowa	85	1	86
Missouri	203	7	210
North Dakota	7	..	7
South Dakota	6	..	6
Nebraska	78	1	79
Kansas	83	1	84
	609	17	626
South Atlantic			
Delaware	8	..	8
Maryland	180	11	191
District of Columbia	30	16	46
Virginia	110	7	117
West Virginia	15	2	17
North Carolina	57	8	65
South Carolina	43	..	43
Georgia	86	1	87
Florida	38	..	38
	567	45	612
East South Central			
Kentucky	85	2	87
Tennessee	178	1	179
Alabama	4	4	8
Mississippi	22	..	22
	289	7	296
West South Central			
Arkansas	68	1	69
Louisiana	68	..	68
Oklahoma	36	..	36
Texas	196	15	211
	368	16	384
Mountain			
Montana	6	1	7
Idaho	2	..	2
Wyoming	2	1	3
Colorado	66	4	70
New Mexico	2	3	5
Arizona	4	..	4
Utah	16	1	17
Nevada	3	..	3
	101	10	111
Pacific			
Washington	45	5	50
Oregon	23	6	29
California	340	11	351
	408	22	430
Territories and Possessions			
Canal Zone	..	2	2
Hawaii	3	4	7
Puerto Rico	5	..	5
	8	6	14
Totals	5,583	460	6,043

Included among United States territories and possessions are Alaska, the Canal Zone, Hawaii, Puerto Rico and the Virgin Islands.

A total of 2,846 physicians secured licenses by this method in 1939.

The physicians licensed by reciprocity and endorsement last year and, in addition, twenty osteopaths so licensed by medical examining boards are recorded by school of graduation and state or territory where licensed in table 10. All the four year medical schools in the United States (sixty-seven) and nine in Canada several osteopathic schools were licensed without examination. Graduates of thirty-three schools now extinct were also represented.

Of the 2,866 candidates licensed by reciprocity and endorsement, 2,649 were graduates of sixty-seven approved medical schools in the United States, forty-two were graduates of nine approved medical schools in Canada, eighty-nine graduates of foreign faculties of medicine, forty-six of medical schools now extinct, twenty graduates of unapproved medical schools and twenty osteopaths.

TABLE 14.—*Licentiates Representing Additions to the Medical Profession Classified by Schools, 1939*

School	Examination	Reciprocity and Endorsement	Total
ARKANSAS			
University of Arkansas School of Medicine	74	..	74
CALIFORNIA			
College of Medical Evangelists	77	20	97
Stanford University School of Medicine	53	2	55
University of California Medical School	60	2	62
University of Southern California School of Medicine	42	..	42
COLORADO			
University of Colorado School of Medicine	44	2	46
CONNECTICUT			
Yale University School of Medicine	6	41	47
DISTRICT OF COLUMBIA			
George Washington University School of Medicine	50	13	63
Georgetown University School of Medicine	55	28	83
Howard University College of Medicine	21	..	21
GEORGIA			
Emory University School of Medicine	50	..	50
University of Georgia School of Medicine	33	..	33
ILLINOIS			
Loyola University School of Medicine	109	2	111
Northwestern University Medical School	128	9	137
University of Chicago, Rush Medical College	120	12	132
University of Chicago, The School of Medicine	30	4	34
University of Illinois College of Medicine	138	1	139
INDIANA			
Indiana University School of Medicine	104	..	104
IOWA			
State University of Iowa College of Medicine	80	2	82
KANSAS			
University of Kansas School of Medicine	70	..	70
KENTUCKY			
University of Louisville School of Medicine	89	1	90
LOUISIANA			
Louisiana State University School of Medicine	64	..	64
Tulane University of Louisiana School of Medicine	36	1	37
MARYLAND			
Johns Hopkins University School of Medicine	60	12	72
University of Maryland School of Medicine and College of Physicians and Surgeons	98	..	98
MASSACHUSETTS			
Boston University School of Medicine	13	29	42
Harvard Medical School	80	46	126
Tufts College Medical School	46	44	90
MICHIGAN			
University of Michigan Medical School	102	2	104
Wayne University College of Medicine	72	..	72
MINNESOTA			
University of Minnesota Medical School	127	1	128
MISSOURI			
St. Louis University School of Medicine	124	9	133
Washington University School of Medicine	101	2	103
NEBRASKA			
Creighton University School of Medicine	62	1	63
University of Nebraska College of Medicine	69	1	69
NEW YORK			
Albany Medical College	6	4	10
Columbia University College of Physicians and Surgs.	80	11	91
Cornell University Medical College	53	6	59
NEW YORK—Continued			
Long Island College of Medicine	80	7	87
New York Medical College, Flower and Fifth Avenue Hospitals	19	48	67
New York University College of Medicine	113	13	126
Syracuse University College of Medicine	37	..	37
University of Buffalo School of Medicine	18	3	21
University of Rochester School of Medicine and Dentistry	38	5	43
NORTH CAROLINA			
Duke University School of Medicine	15	14	29
OHIO			
Ohio State University College of Medicine	80	1	81
University of Cincinnati College of Medicine	64	1	65
Western Reserve University School of Medicine	62	1	63
OKLAHOMA			
University of Oklahoma School of Medicine	39	..	39
OREGON			
University of Oregon Medical School	46	1	47
PENNSYLVANIA			
Hahnemann Medical College and Hospital of Phila	120	1	121
Jefferson Medical College of Philadelphia	124	3	127
Temple University School of Medicine	114	2	116
University of Pennsylvania School of Medicine	138	7	145
University of Pittsburgh School of Medicine	59	..	59
Woman's Medical College of Pennsylvania	15	..	15
SOUTH CAROLINA			
Medical College of the State of South Carolina	41	..	41
TENNESSEE			
Meharry Medical College	32	..	32
University of Tennessee College of Medicine	100	..	100
Vanderbilt University School of Medicine	48	1	49
TEXAS			
Baylor University College of Medicine	68	..	68
University of Texas School of Medicine	90	..	90
VERMONT			
University of Vermont College of Medicine	23	11	34
VIRGINIA			
Medical College of Virginia	55	1	56
University of Virginia Department of Medicine	54	..	54
WISCONSIN			
Marquette University School of Medicine	60	3	63
University of Wisconsin Medical School	56	..	56
CANADA			
Dalhousie University Faculty of Medicine	15	1	16
Laval University Faculty of Medicine	1	..	1
McGill University Faculty of Medicine	53	4	57
Queen's University Faculty of Medicine	5	..	5
University of Alberta Faculty of Medicine	1	..	1
University of Manitoba Faculty of Medicine	6	..	6
University of Montreal Faculty of Medicine	1	..	1
University of Toronto Faculty of Medicine	23	1	24
University of Western Ontario Medical School	13	..	13
Foreign Medical Faculties	753	8	761
Unapproved Schools	257	15	272
Totals	5,593	449	6,043

were represented, as well as graduates of medical schools now extinct, unapproved schools in the United States and faculties of medicine abroad. The largest number of graduates of any one school were from Harvard Medical School, 108, who were licensed in thirty states. St. Louis University had eighty-six licensed by this method in twenty-one states, Rush Medical College eighty-two in twenty-seven states and the University of Tennessee College of Medicine eighty-one in twenty-three states. Graduates of twenty-nine faculties of medicine in Europe, two licensing corporations of Great Britain, two unapproved schools and

LICENTIATES REPRESENTING ADDITIONS TO THE MEDICAL PROFESSION

Licentiates representing additions to the medical profession during 1939 are recorded by states in table 12. The figures represent candidates examined in 1939 and licensed; also those examined in previous years whose licenses were withheld for lack of internship, citizenship, and so on, and issued in 1939, and those without previous state license who were during the year certified on the basis of the certificate of the National Board of Medical Examiners, government services, Canadian and foreign credentials. In the

main, however, they represent recent graduates. Altogether, 6,043 were added to the profession. The number removed by death annually approximates 4,000. It would appear, therefore, that about 2,000 were added to the medical profession in 1939. While it is not certain that all those licensed are in practice, it may be assumed that the great majority are. It is interesting to note that, of 9,260 licenses issued throughout the year, 6,043 are actual additions to the medical profession. The largest number in any one state added to the profession was in New York, 1,162; Illinois added 485 and Pennsylvania 476. More than 300 received their first license in California and Ohio. The physician population of Massachusetts, Michigan, Missouri, New Jersey and Texas was increased by between 200 and 300. Indiana, Maryland, Minnesota, Tennessee, Virginia and Wisconsin increased their population of physicians by between 100 and 200. Thirty-two states, the District of Columbia, the Canal Zone, Hawaii and Puerto Rico added less than 100. Of the licentiates forming additions to the medical profession last year, 5,583 secured this privilege by examination and 460 by the endorsement of credentials. Those licensed by endorsement consist of a few licensed on foreign credentials and to a large extent diplomates of the National Board of Medical Examiners.

Figures for four previous years and 1939 are shown in table 11 for comparison.

In 1935 there were 5,099 added by means of examination and 411 by endorsement of credentials, a total of 5,510. In 1936 there were 665 more added than in 1935; in 1937, 245 more than in 1936, 910 more than in 1935. In 1938 there were 167 fewer than in 1937 but seventy-eight more than in 1936 and 743 more than in 1935. In 1939 again 210 fewer physicians were added as compared with 1938 and also fewer than any year except 1935, in which year 533 less were licensed. Fourteen physicians were added in the Canal Zone, Hawaii and Puerto Rico.

Table 13 records increases in the physician population grouped in nine geographic divisions, namely the New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain and Pacific states and the territories and possessions. The largest group, 1,848, was added in the Middle Atlantic states, the East North Central group had a total of 1,296, the West North Central 626, South Atlantic 612, the Pacific states 430, New England 426, West South Central 384, East South Central 296 and the Mountain states 111. Two were added in the Canal Zone, seven in Hawaii and five in Puerto Rico. Figures for 1938 are shown here for comparison.

States	1938	1939
New England	407	426
Middle Atlantic	1,905	1,848
East North Central	1,229	1,296
West North Central	665	626
South Atlantic	659	612
East South Central	325	296
West South Central	402	384
Mountain	116	111
Pacific	477	430
Territories and Possessions	27	14
Totals	6,353	6,043

In table 14 those representing additions to the medical profession are arranged by schools; the same as those examined are listed in table 2, existing approved medical schools in the United States and Canada, foreign faculties of medicine and unapproved schools.

The 6,043 physicians representing additions to the medical profession included graduates from sixty-seven approved medical schools of the United States, nine approved schools in Canada, and others. The greatest numbers from any one school were 159 from the University of Illinois College of Medicine, 145 from the University of Pennsylvania School of Medicine and 137 from Northwestern University Medical School. Of the United States schools the Albany Medical College had the fewest, ten, while only one each was represented by the Canadian medical schools, Laval, Alberta and Montreal. McGill University Faculty of Medicine added fifty-seven of its graduates to the physician population of the United States. From the United States schools

TABLE 15.—*Requirements of Preliminary Training by Medical Licensing Boards*

Two Years of College		
Alabama	Louisiana	Oregon
Alaska	Maine	Pennsylvania
Arizona	Maryland	Puerto Rico
Arkansas	Michigan	Rhode Island
Colorado	Minnesota	South Carolina
Delaware	Mississippi	South Dakota
District of Columbia	Montana	Tennessee
Florida	Nevada	Texas
Georgia	New Hampshire	Utah
Hawaii	New Jersey	Vermont
Idaho	New Mexico	Virginia
Illinois	New York	Washington
Indiana	North Carolina	West Virginia
Iowa	North Dakota	Wisconsin
Kansas	Ohio	Wyoming
Kentucky	Oklahoma	
One Year of College		
California		Connecticut
High School Graduation or Its Equivalent		
Massachusetts	Missouri	Nebraska

there were 4,455 graduates added to the profession by examination and 431 by reciprocity or endorsement of credentials, a total of 4,886. From the Canadian schools 124 were added, by examination 118 and by reciprocity or endorsement six. There were 761 graduates of foreign faculties of medicine and 272 unapproved graduates. Altogether there were 5,583 graduates of all schools examined and 460 were licensed by reciprocity or endorsement, a total of 6,043.

REQUIREMENTS OF PRELIMINARY TRAINING BY MEDICAL LICENSING BOARDS

The minimum requirement for admission to approved medical schools since 1918 has been two years of college training which include English and theoretical and practical courses in physics, biology and general and organic chemistry. Since 1938, three years or more in college has been recommended. With but five exceptions, namely California, Connecticut, Massachusetts, Missouri and Nebraska, the state licensing boards also exact the two year requirement. The law in the state of Massachusetts will change in 1941. Although their statutes do not conform with the two year college prerequisite, these states with the exception of Massachusetts do not license other than graduates of approved schools (table 15). Alaska, Hawaii and Puerto Rico likewise require two years of preliminary training.

REQUIRED HOSPITAL INTERNSHIPS

The medical schools and licensing boards requiring a hospital internship for the M.D. degree and state licensure, respectively, are shown in tables 16 and 17.

Twenty-two states, the District of Columbia, Alaska, Hawaii and Puerto Rico require that all applicants for licensure possess a hospital internship. The first state exacting this requirement was Pennsylvania in 1914. In addition, other states require the internship of graduates of faculties of medicine abroad and reciprocity or endorsement applicants.

TABLE 16.—*Internship Required by Medical Schools*

University of California Medical School
College of Medical Evangelists
University of Southern California School of Medicine
Stanford University School of Medicine
Loyola University School of Medicine
Northwestern University Medical School
University of Illinois College of Medicine
Louisiana State University School of Medicine
Wayne University College of Medicine
University of Minnesota Medical School
Duke University School of Medicine *
University of Cincinnati College of Medicine
Marquette University School of Medicine
University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
McGill University Faculty of Medicine
University of Montreal Faculty of Medicine

* Requires a two year internship.

TABLE 17.—*Internship Required by Medical Licensing Boards of All Candidates* *

Alabama	Louisiana	Rhode Island
Alaska	Michigan	South Dakota
Arizona	New Hampshire	Utah
Delaware	New Jersey	Vermont
District of Columbia	North Dakota	Washington
Hawaii	Oklahoma	West Virginia
Idaho	Oregon	Wisconsin
Illinois	Pennsylvania	Wyoming
Iowa	Puerto Rico	

* In addition some states require the internship of graduates of medical faculties abroad and reciprocity or endorsement applicants. See tables 9 and 23.

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ates of faculties of medicine abroad and reciprocity or endorsement applicants.

Thirteen schools in the United States and four in Canada exact the internship requisite. A few of the schools will accept research or other clinical work in lieu of the internship.

CANDIDATES EXAMINED, 1935-1939

In table 18 are listed the number of candidates examined in the various states, territories and possessions in the five year period from 1935 to 1939 inclusive, showing those who passed and failed. In five years 4,985 were tested in New York and passed, 2,595 in Pennsylvania, 2,395 in Illinois, 1,830 in California, 1,665 in Ohio, 1,256 in Massachusetts, 1,136 in Michigan, 1,118 in New Jersey, and 1,019 in Maryland and Minnesota. Thirty-one states licensed less than 500 and eleven less than 100. The smallest number, ten, passed the examinations in New Mexico.

The percentage of candidates who failed in the examinations in the past five years is given in the last column. The percentage of failures in all states has increased from 9.1 in 1935 to 16.3 in 1939. In the five year period, 48.2 per cent of the applicants failed in Massachusetts. The high percentage in this state is due to the fact that by law the licensing board is required to admit to its examination the graduates of unapproved schools, many of whom repeatedly fail. Connecticut had a failure percentage of 28.1 in five years and New York 26.5. The high percentage in this state is occasioned by the fact that New York admits a great many graduates of foreign medical schools to its licensing examinations. The third highest proportion of failures was in Florida with 18.2. Florida has no reciprocal relations with any state, all applicants being required to take the licensing examination. Graduates of earlier years experience difficulty in passing examinations. On the other hand, Arkansas, Nebraska, New Mexico, North Carolina, Oklahoma and Oregon—six states—had no failures. Alabama, California, Colorado, the District of Columbia, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Montana, New Hampshire, Ohio, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia and Wisconsin—twenty-seven states—had less than 5 per cent. Of these thirteen failed less than 1 per cent.

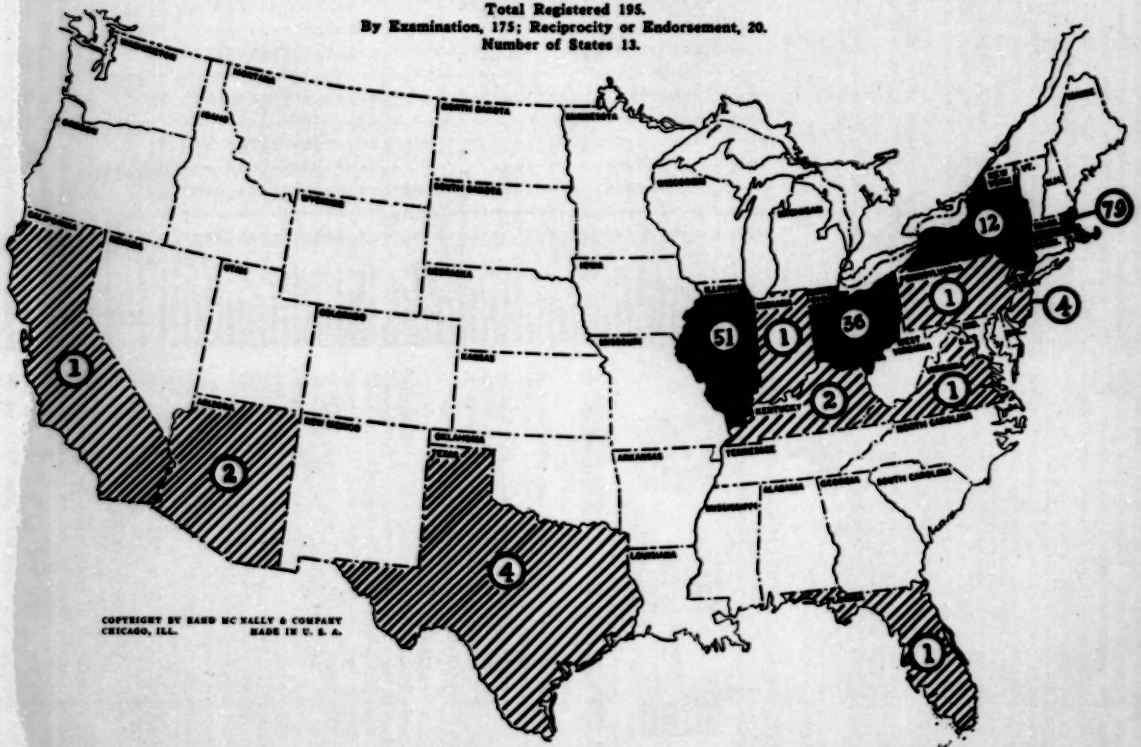
A total of 35,890 candidates were examined in the five years from 1935 to 1939 inclusive, of whom 31,746 passed and 4,144, 11.5 per cent, failed. These figures represent examinations given and not individuals. A candidate who fails more than once in a given year is counted as only one failure, but should he fail in one of the succeeding years in another state he is counted in that year also. Likewise, if a candidate fails and later passes, whether in the same or in a later year, he is

TABLE 18.—*Candidates Examined, 1935-1939*

	1935		1936		1937		1938		1939		Totals for 5 Years		
	Passed	Failed	Passed	Failed	Passed	Failed	Passed	Failed	Passed	Failed	Passed	Failed	Percentage Failed
Alabama	37	0	21	4	26	1	29	0	14	0	129	5	3.7
Arizona	8	3	26	9	14	2	15	0	11	1	74	14	15.9
Arkansas	42	0	56	0	48	0	72	0	57	0	275	0	0.0
California	228	14	369	18	349	20	402	15	382	20	1,830	87	4.5
Colorado	59	1	79	1	76	3	78	3	69	3	361	11	2.9
Connecticut	63	13	76	30	80	21	73	24	53	47	345	135	28.1
Delaware	13	5	17	0	14	2	14	0	11	2	69	9	11.5
Dist. Columbia	43	1	32	1	41	2	23	0	33	0	172	2	1.0
Florida	135	24	154	44	164	38	153	41	172	37	778	174	18.2
Georgia	88	2	89	0	83	0	72	0	90	0	422	2	0.4
Idaho	7	1	13	0	20	0	28	0	24	8	92	9	8.9
Illinois	423	10	471	6	466	5	499	12	523	18	2,382	51	4.1
Indiana	115	4	116	0	123	2	108	1	108	0	573	7	1.2
Iowa	77	1	103	0	88	0	94	11	104	3	466	14	2.9
Kansas	95	0	98	0	82	0	93	1	85	0	451	1	0.4
Kentucky	81	0	84	0	81	1	81	1	88	0	415	2	0.4
Louisiana	134	0	122	1	173	1	184	2	153	0	777	4	0.5
Maine	45	1	50	0	58	2	39	7	42	6	237	16	6.3
Maryland	194	28	202	34	209	27	227	38	187	30	1,019	143	12.3
Massachusetts	199	229	271	239	202	218	207	229	277	257	1,256	1,173	48.3
Michigan	244	1	238	0	211	1	226	1	217	0	1,136	3	0.2
Minnesota	173	0	191	1	219	0	219	2	217	1	1,019	4	0.3
Mississippi	30	0	32	4	23	2	31	1	21	0	136	9	6.9
Missouri	214	6	202	3	166	12	174	3	211	0	969	26	2.6
Montana	8	0	15	0	4	1	11	0	11	0	49	1	2.0
Nebraska	90	0	75	0	79	0	85	0	78	0	407	0	0.0
Nevada	3	0	4	0	5	0	5	0	0	0	17	1	5.6
New Hampshire	5	0	24	0	18	0	17	0	14	0	78	2	2.5
New Jersey	182	5	168	6	250	33	281	53	237	111	1,118	208	15.6
New Mexico	1	0	3	0	2	0	2	0	2	0	10	0	0.0
New York	879	196	992	249	1,072	291	1,078	372	1,024	494	4,985	1,801	26.5
North Carolina	65	0	64	0	83	0	85	0	57	0	354	0	0.0
North Dakota	14	1	14	0	13	0	15	2	17	1	73	4	5.2
Ohio	295	3	312	2	347	5	342	11	369	15	1,665	36	2.1
Oklahoma	62	0	70	0	49	0	46	0	43	0	270	0	0.0
Oregon	35	0	46	0	58	0	53	0	26	0	240	0	0.0
Pennsylvania	464	6	541	7	529	4	513	9	549	11	2,595	31	1.1
Rhode Island	53	4	22	7	38	7	36	1	25	0	164	19	10.4
South Carolina	49	0	32	0	46	1	39	1	48	0	214	2	0.9
South Dakota	29	0	15	0	17	2	8	0	15	0	75	2	2.6
Tennessee	151	1	178	1	208	1	179	3	193	0	909	6	0.6
Texas	186	7	176	19	181	19	200	26	206	15	953	83	7.9
Utah	20	1	23	0	10	0	12	0	17	0	82	1	1.2
Vermont	36	0	38	0	36	0	26	1	17	0	153	1	0.7
Virginia	109	1	110	0	150	2	127	0	113	1	609	4	0.6
Washington	54	0	56	1	57	1	72	0	50	0	290	2	0.6
West Virginia	38	0	39	0	60	1	65	0	53	0	255	1	0.4
Wisconsin	111	0	112	1	118	0	114	0	111	0	566	1	0.1
Wyoming	3	0	1	0	2	1	7	0	8	1	21	2	8.7
U. S. Terr. and Possessions	40	6	21	12	40	4	34	9	30	4	165	35	17.5
Totals—Examined	6,436		6,915		7,331		7,455		7,753		35,890		
Passed	5,852		6,321		6,601		6,583		6,389		31,746		
Failed	584		594		730		872		1,364		4,144		
Percentage—Failed	9.1		10.0		10.0		11.7		16.3		11.5		

CHART 1.—STATES REGISTERING GRADUATES OF UNAPPROVED MEDICAL SCHOOLS, 1939

Total Registered 195.
By Examination, 175; Reciprocity or Endorsement, 20.
Number of States 13.



The states in black registered more than 5 such candidates, those shaded 5 or less.

counted as failed and passed. It seems likely that with 4,144 failures who apply for examinations and physicians who apply for licensure in more than one state, approximately 32,000 individuals were examined. This figure gives a fair estimate of the number of physicians added to the profession each year. On page 1650 will be found a table giving exact figures for the period 1935 to 1939 inclusive.

REGISTRATION, 1904-1939

A study of totals and percentages for thirty-six years (1904-1939) is presented in table 19. The number who passed in 1939 was ninety-four less than in 1938 but 268 more than in 1936 and 796 more than in 1904. The number registered without examination, 2,866, was eighty-one less than in 1938. Contrasting these figures with those for 1904 will show the great use being made of this system of licensure. By both methods, examination and endorsement of credentials, 9,355 were registered, 175 less than in 1938. The number registered in 1937, 9,795, represented the largest number of candidates registered in thirty-six years. Of those examined in 1939, 16.3 per cent failed as compared with 21.7 per cent in 1908. While these figures represent those registered in the years given, they do not in all states represent the number licensed in a given year. Licenses are withheld in many states, as indicated in the text describing table 1.

TABLE 19.—*Registration, 1904-1939*

Year	All Candidates Examined			Registered Without Examination	Total Registered
	Examined	Passed	Percentage Failed		
1904	7,686	5,691	19.3	1,604	6,897
1905	7,178	5,688	20.8	364	6,052
1906	6,949	5,073	26.7	1,502	7,575
1907	7,370	5,731	21.3	1,427	7,158
1908	7,775	6,089	21.7	1,284	7,373
1909	7,395	5,965	19.6	1,331	7,296
1910	7,010	5,718	18.4	1,640	7,358
1911	6,964	5,592	19.6	1,343	6,935
1912	6,980	5,467	20.5	1,272	6,739
1913	6,458	5,253	18.6	1,292	6,545
1914	5,579	4,379	21.5	1,439	5,818
1915	5,324	4,507	15.5	1,259	5,766
1916	4,979	4,151	14.9	1,353	5,504
1917	4,753	4,084	14.1	1,360	5,444
1918	3,886	3,182	13.2	1,047	4,230
1919	4,720	4,074	14.2	2,545	6,619
1920	4,796	4,052	15.5	2,358	6,410
1921	4,925	4,228	12.4	2,186	6,414
1922	4,681	3,839	12.2	2,073	5,912
1923	4,728	4,027	14.8	2,488	6,520
1924	5,020	4,754	11.9	1,919	6,673
1925	5,020	5,447	9.2	1,860	7,307
1926	5,767	5,311	7.9	1,964	7,275
1927	5,384	4,997	7.2	2,174	7,171
1928	5,454	5,086	6.7	2,228	7,314
1929	5,627	5,240	6.9	2,459	7,709
1930	5,563	5,247	5.7	2,566	7,813
1931	5,680	5,361	6.3	2,231	7,474
1932	5,686	5,258	7.6	1,864	7,122
1933	5,670	5,241	7.6	1,869	7,110
1934	6,140	5,624	8.4	2,160	7,784
1935	6,438	5,852	9.1	2,195	8,047
1936	6,915	6,221	10.0	2,770	8,991
1937	7,321	6,601	10.0	3,194	9,795
1938	7,455	6,583	11.7	2,947	9,530
1939	7,733	6,469	16.3	2,866	9,355

Table 19 shows that the total number registered by examination in 1939 and a decrease of eighty-one in the number registered by reciprocity or endorsement.

There was a decrease of ninety-four in the number registered by examination in 1939 and a decrease of eighty-one in the number registered by reciprocity or endorsement.

TABLE 20.—*Graduates of Approved Schools and Others Registered, 1922-1939*

Year	Graduates of Approved Schools		Others		Totals
	Number	Per Cent	Number	Per Cent	
1922	4,519	80.5	1,093	19.5	5,612
1923	5,196	80.8	1,234	19.2	6,430
1924	5,786	85.2	987	14.8	6,673
1925	6,313	86.4	994	13.6	7,307
1926	6,441	88.7	824	11.3	7,265
1927	6,410	89.4	761	10.6	7,171
1928	6,585	90.1	729	9.9	7,314
1929	7,021	91.0	697	9.0	7,709
1930	7,011	92.1	602	7.9	7,613
1931	6,902	92.8	542	7.2	7,474
1932	6,675	93.7	447	6.3	7,122
1933	6,774	93.7	436	6.3	7,230
1934	7,170	92.1	614	7.9	7,784
1935	7,382	91.5	665	8.5	8,047
1936	7,928	88.2	1,063	11.8	8,991
1937	8,380	85.6	1,415	14.4	9,795
1938	8,303	87.1	1,227	12.9	9,530
1939	8,061	86.2	1,294	13.8	9,355

The total number examined was 278 more than in 1938, while the number passed decreased. The increase in failures is largely the failure of many of the graduates of unapproved schools, osteopaths granted medical privileges, and foreign graduates to pass the test on the first try. This is further outlined in subsequent tables.

TABLE 21.—*Graduates of Unapproved Medical Schools Registered, 1934-1939*

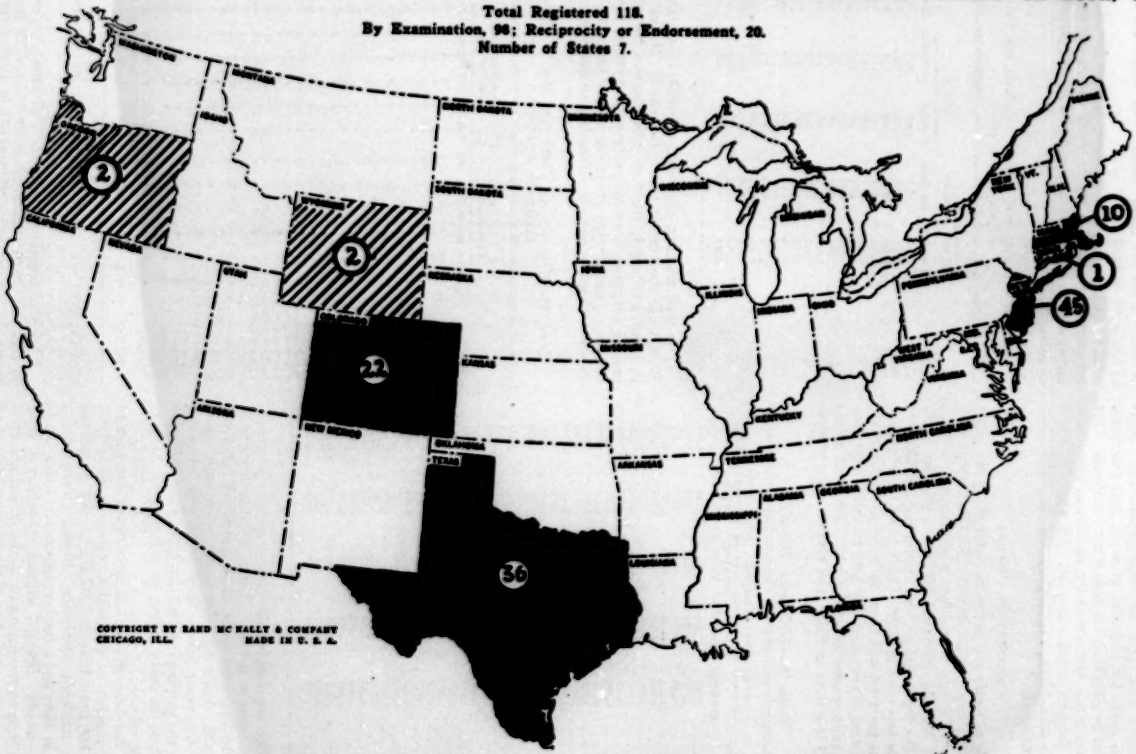
	Examination						Reciprocity and Endorsement						Total
	1934	1935	1936	1937	1938	1939	1934	1935	1936	1937	1938	1939	
Arizona	0	0	0	2	1	2	0	0	0	0	0	0	5
Arkansas	1	0	0	0	1	0	0	0	0	0	1	0	3
California	1	1	0	0	0	0	0	2	0	0	0	1	5
Florida	0	0	1	2	2	1	0	0	0	0	0	0	6
Idaho	0	0	0	0	0	0	0	0	0	0	0	1	1
Illinois	33	67	84	92	60	51	0	0	0	0	0	0	377
Indiana	0	1	0	0	0	0	0	0	0	0	3	1	5
Kansas	1	0	0	0	0	0	0	0	0	0	0	0	1
Kentucky	0	0	0	0	0	0	0	0	0	2	1	2	5
Massachusetts	34	25	77	97	58	70	0	0	0	0	0	0	361
Mississippi	1	0	0	0	0	0	1	0	0	0	0	0	2
Missouri	0	0	0	0	0	0	0	2	0	0	1	0	3
Nebraska	0	0	0	0	0	0	0	0	0	1	0	0	1
New Jersey	0	0	3	1	7	0	0	0	0	0	4	0	26
New Mexico	0	0	1	0	1	0	0	2	1	0	0	0	7
New York	0	0	0	0	0	0	0	0	13	14	8	12	47
North Carolina	0	0	1	2	0	0	0	0	0	0	0	0	3
North Dakota	0	0	0	0	0	0	0	1	0	0	0	0	1
Ohio	0	10	31	27	32	36	0	0	0	0	0	0	129
Oklahoma	0	1	0	0	0	0	0	0	0	0	0	0	1
Pennsylvania	0	0	0	1	4	1	0	0	0	0	0	0	6
Rhode Island	0	1	0	0	0	0	0	0	0	0	0	0	1
South Dakota	0	1	0	0	0	0	0	0	0	0	0	0	1
Texas	0	0	0	0	1	4	2	0	0	0	0	3	10
Virginia	0	0	0	1	0	1	0	0	0	0	0	0	2
Wisconsin	0	0	0	0	0	0	0	0	1	0	0	0	1
Alaska and Hawaii	1	0	1	1	0	0	0	0	1	0	0	0	4
Totals	94	116	201	212	167	175	9	7	19	22	20	20	1,062

GRADUATES OF APPROVED SCHOOLS AND OTHERS REGISTERED, 1922-1939

The educational fitness of the individuals registered in eighteen years, 1922-1939, is shown in table 20. Of the 9,355 registered by all methods in 1939, 8,061, or 86.2 per cent, graduated from approved medical schools and there were 1,294, 13.8 per cent, other practitioners registered. In the computation of these figures, all

CHART 2.—MEDICAL EXAMINING BOARDS REGISTERING OSTEOPATHS TO PRACTICE MEDICINE, SURGERY OR BOTH, 1939

Total Registered 118.
By Examination, 98; Reciprocity or Endorsement, 20.
Number of States 7.



The states in black registered more than 5 such candidates, those shaded 5 or less.

schools rated as class A and B by the Council on Medical Education and Hospitals since 1907 are classified as approved. In the column "others" are included graduates of institutions prior to 1907, of foreign faculties of medicine, class C graduates, osteopaths and graduates of schools that have been refused recognition. In 1928 the classification A, B and C by the Council was discontinued and medical schools have since been considered either as approved or unapproved.

Of the 9,355 graduates registered in 1939, 6,489 were registered after examination and 2,866 by reciprocity or endorsement of credentials. Among those examined there were 5,374 graduates of approved medical schools in the United States and Canada, 269 graduates of unapproved institutions and 846 others. Likewise among those registered by endorsement there were 2,687 graduates of approved medical schools in the United States and Canada, forty-five from unapproved schools and 134 others. The 1,294 other than graduates of approved schools included 314 graduates of unapproved schools in the United States. New York registered 927 graduates of approved schools of a total of

TABLE 22.—*Graduates of Schools of Osteopathy Registered by Medical Examining Boards, 1934-1939*

	Examination						Reciprocity and Endorsement						
	1934	1935	1936	1937	1938	1939	1934	1935	1936	1937	1938	1939	Total
Colorado	10	13	16	19	16	22	0	0	0	0	0	0	96
Connecticut	1	0	1	1	0	1	0	0	0	0	0	0	4
Dist. Columbia	0	0	0	0	1	0	1	0	0	0	0	0	2
Massachusetts	21	5	12	16	10	10	0	0	0	0	0	0	76
New Hampshire	0	1	1	4	2	0	0	0	0	2	1	0	11
New Jersey	0	2	0	32	66	45	0	0	0	0	0	0	145
Oregon	0	0	1	1	1	1	0	0	2	0	1	1	8
Texas	7	7	11	17	22	19	17	13	34	72	37	17	273
Virginia	2	4	4	2	1	0	0	1	0	0	0	0	14
Wisconsin	2	0	3	1	0	0	3	0	5	2	3	0	19
Wyoming	0	0	0	0	0	0	1	2	4	4	1	2	14
Totals	43	32	49	113	101	98	22	16	45	80	43	20	664

1,439. This state licensed the greatest number with foreign credentials. Only approved physicians were registered in Arkansas, Delaware, Idaho, Kansas, Nebraska, Nevada, North Dakota, Oklahoma, South Carolina and West Virginia.

The number of graduates of approved schools in the period shown has always been in the bracket above 4,000, while in the other groups it has until recent years been below 700.

GRADUATES OF UNAPPROVED MEDICAL SCHOOLS REGISTERED, 1934-1939

In table 21 will be noted the number of graduates of those institutions which do not meet the standards for approval outlined by the House of Delegates of the American Medical Association who were registered with or without examination from 1934 to 1939 inclusive.

Thirteen states registered 195 such graduates in 1939, 175 by examination and twenty without examination, eight more than in 1938. One each was licensed in California, Florida, Indiana, Pennsylvania and Virginia.

In the six year period shown, 1,062 graduates of unapproved schools and undergraduates were registered, 965 by examination and ninety-seven by reciprocity.

Chart 1, on page 1654, indicates by shaded lines those registering fewer than six graduates of unapproved medical schools and by a solid area those registering more than five such candidates during 1939.

GRADUATES OF SCHOOLS OF OSTEOPATHY REGISTERED BY MEDICAL EXAMINING BOARDS, 1934-1939

The number of graduates of schools of osteopathy granted the privilege of practicing medicine, surgery or both by the medical examining boards from 1934 to 1939 inclusive are given in table 22. Osteopaths licensed as physicians and surgeons by osteopathic boards, as for example those in California, are not included in these statistics.

In 1939 seven states registered such individuals, ninety-eight by examination and twenty by endorsement of credentials, namely in Colorado, Connecticut, Massachusetts, New Jersey, Oregon, Texas and Wyoming. These facts are shown graphically in chart 2 on page 1656, indicating by shaded lines those registering fewer than six graduates and by a solid area those licensing more than five such candidates during 1939.

In the six year period 1934-1939, 664 graduates of osteopathic schools secured licenses to practice medicine, surgery or both. Texas registered 273, New Jersey 145, Colorado ninety-eight and Massachusetts seventy-six; other states fewer than twenty.

In Colorado osteopaths have no separate board. They are admitted to the examination for a license to practice medicine. The statute of Colorado is silent with respect to the scope of practice authorized by a license issued to osteopaths.

The Connecticut statute provides that any registered osteopath may practice either medicine, surgery or both, as the case may be, after passing a satisfactory examination before the medical examining board.

The Massachusetts statute, by definition, includes osteopathy in the practice of medicine and does not differentiate the type of license issued to an osteopathic applicant. The medical practice act requires that any applicant for license to practice must be in possession of a degree of doctor of medicine, or its equivalent, from a legally chartered medical school that gives a full four year course of instruction of not less than thirty-two weeks in each year. An amendment to the medical practice act providing an approving authority is not yet effective.

In New Hampshire osteopaths are granted the right to practice medicine and surgery by the Board of Registration in Medicine.

Osteopaths who are duly registered and licensed to practice osteopathy in the state of New Jersey, who present three years of practice of surgery in a hospital approved by the Board of Medical Examiners, may be admitted to the examination to be licensed to practice medicine and surgery.

The statutes of Texas provide for the issuing of a license to practice medicine only. So far as the statutes indicate, the osteopaths are not restricted in their field of practice.

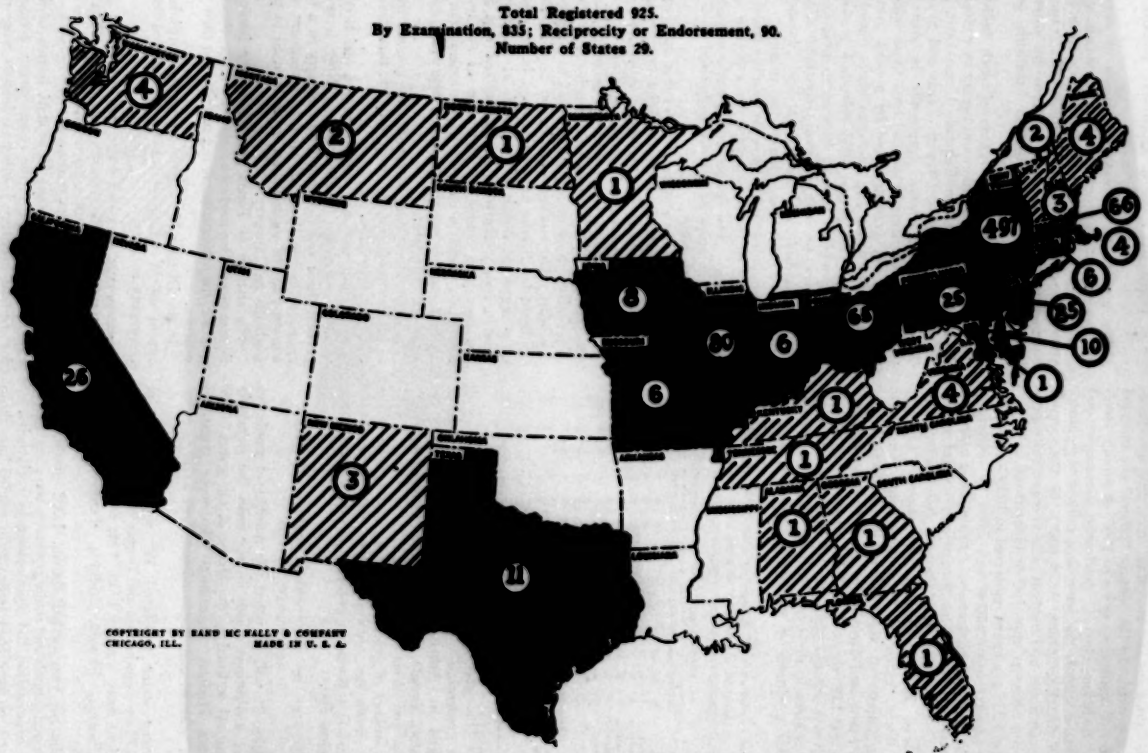
In the District of Columbia, Oregon, Virginia, Wisconsin and Wyoming, osteopaths are granted the right to practice surgery.

PHYSICIANS EXAMINED ON THE BASIS OF CREDENTIALS OBTAINED IN COUNTRIES OTHER THAN THE UNITED STATES AND CANADA, 1939

Data recently received from state boards of medical examiners pertaining to the requirements of candidates for medical licensure holding credentials from medical schools outside the United States and Canada are presented in table 23. Thirteen states report that, because of the inability to evaluate foreign credentials, holders

CHART 3.—STATES REGISTERING GRADUATES OF MEDICAL FACULTIES ABROAD, 1939

Total Registered 925.
By Examination, 835; Reciprocity or Endorsement, 90.
Number of States 29.



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The states in black registered more than 5 such candidates, those shaded 5 or less.

of such certificates are not eligible for licensure. Of the remaining, twenty-one require full citizenship and twelve require first citizenship papers as a condition precedent to taking the state board examinations. In some states the requirement is made by rule of the medical board, in others the provision is by statute. In addition, other restrictions are imposed. Eleven states require a certificate in the basic sciences. Twenty-three states require a one year internship in a United States hospital approved for intern training. In five states there is a requirement of a senior year's work in an approved medical school in the United States. Application for licensure must be on file six months prior to the date of examination in two states. These data are compiled on the basis of information furnished by state examining boards.

Many of the graduates of foreign faculties of medicine are seeking or are serving internships in approved hospitals in the United States. The Council on Medical Education and Hospitals advises hospitals approved for the training of interns that should they desire to employ such interns the following resolution should be complied with:

Resolved, That, when suitable graduates of class A schools in the United States and Canada are not available, hospitals approved for intern training may accept graduates of European universities who have passed parts I and II of the examinations of the National Board of Medical Examiners.

Hospitals in Eastern states are absorbing most of the graduates of foreign faculties of medicine.

Table 24 presents figures covering physicians examined on the basis of credentials obtained in countries other than the United States and Canada by licensing boards of the United States and by Hawaii and Puerto Rico. The figures represent both American and foreign born physicians educated abroad. It will be recalled that during the last ten years students from the United States have migrated to Europe to pursue medical courses. In 1937-1938, 1,346 citizens of the United States were so enrolled. Similar figures obtain for previous years. The majority, however, of those now being licensed represent foreign born physicians. Eighty-nine faculties of medicine, itcluding three licensing corporations, of seventeen European and three other countries were represented. There were 1,692 examined, of whom 839 passed and 853 failed, 50.4 per cent. Graduates of the Universtiy of Vienna (432) were examined in fifteen states, 52.0 per cent of whom failed. Fourteen states examined students of the University of Berlin and ten states graduates of the Universities of Bologna and Rome. Graduates of all other schools were examined in less than ten states. Twenty-six states, Hawaii and Puerto Rico examined physicians educated abroad. The state of New York had the greatest number, 1,093, of whom 472 passed and 621 failed, 56.8 per cent. New Jersey examined 139, with sixty successful and seventy-nine unsuccessful results; 56.8 per cent. Illinois examined ninety-six, of whom seventeen, 17.7 per cent, failed and Maryland ninety, having 27.8 per cent failures.

In addition to the figures presented in this table, ninety graduates of foreign faculties of medicine were licensed in 1939 without examination by endorsement of credentials.

Chart 3, page 1658, shows in graphic form the states which during 1939 registered graduates of foreign medical faculties by examination, reciprocity and endorsement, or both. Included in the figures on the chart are the ninety granted licenses by reciprocity and endorsement, with but a few exceptions, on the basis of a license obtained in the United States. From a perusal of tables 2, 7 and 10 it can be ascertained how many were licensed by both these means in the various states. The

(CONTINUED ON PAGE 1661)

TABLE 23.—*Requirements of Candidates for Medical Licensure on the Basis of Credentials Obtained in Countries Other Than the United States and Canada*

	Admitted to Examination	Admitted by Endorsement of State License*	Citizenship	Basic Science Certificate	Internship	Further Medical Training	Examination Fee, Dollars	Other Requirements
Alabama	+	..	+	..	+	..	10	1
Arizona	Not accepted							
Arkansas (regular board)	Not accepted							
California	+	..	..	..	+[18]	+[18]	25	11
Colorado	+	..	1st P	+	..	..	25[4]	8
Connecticut (regular board)	+	..	1st P	+	..	..	25	..
Delaware (regular board)	+	+	+	..	+	..	25	1
District of Columbia	..	+[6]	..	+	+	..	50	19
Florida	+	..	+	+	..	+[7]	25	..
Georgia	+	..	+	..	..	+[7]	20	..
Idaho	+	..	+[6]	..	..	..	25	..
Illinois	+	+[20]	1st P	..	+	..	10	..
Indiana	+	+	+[5]	..	..	+[7]	25	..
Iowa	+[10]	..	+	+	+[2]	+[2]	25	..
Kansas	+	+	+	..	+	..	25	11
Kentucky	..	+[12]	+	..	+	..	25	..
Louisiana	Not accepted							
Maine	+	..	1st P	..	+	..	25	11
Maryland (regular board)	+	+	1st P	..	..	..	25	11 19
Massachusetts	..	..	1st P	..	..	..	25	..
Michigan	+	+	+	+	+	+[7]	..	21
Minnesota	+	..	+	+	..	..	20	11 22
Mississippi	+	..	+	..	+	..	10.25	..
Missouri	+	..	+	..	+	..	15	..
Montana	+	..	+	..	+	..	50	..
Nebraska	+	..	+	+	..	..	25	..
Nevada	Not accepted							
New Hampshire	+	+	+	..	+	..	20	..
New Jersey	+	+	+	..	+[17]	..	25	11
New Mexico	Not accepted							
New York	+	+	1st P	..	..	..	25	..
North Carolina	Not accepted							
North Dakota	+	..	+	..	+	..	25	11
Ohio	+[10]	+	1st P	..	+[13]	+[13]	25	11
Oklahoma	Not accepted							
Oregon	+	..	1st P	+	+[2]	+[2]	25	..
Pennsylvania	+	..	1st P	+	..	..	25	11
Rhode Island	+	..	1st P	..	+[14]	..	20	..
South Carolina	Not accepted							
South Dakota	Not accepted							
Tennessee	Not accepted							
Texas	+	+	+	..	..	..	25	..
Utah	..	+[12]	+	..	+	..	25	..
Vermont	+[10]	+	+	..	+	..	20	..
Virginia	+	..	+	..	..	..	25	..
Washington	+	..	1st P	+	+	+[7]	25	..
West Virginia	Not accepted							
Wisconsin	Not accepted							
Wyoming	Not accepted							
Alaska	+	+	..	..	+	..	25	..

Compilation of data furnished by state examining boards. This information is not guaranteed as there may have been changes of which this office has not been advised. For an authentic statement write directly to the medical board.

* Refer to chart of "Reciprocity and Endorsement Policies" for further data.

1. Certificate of National Board of Medical Examiners and licensure in country in which school of graduation is located.
2. Internship or one year in medical school in United States.
3. Certificate of National Board of Medical Examiners.
4. For graduates of last five years; if more than five years $50.
5. Residence of one year in Delaware.
6. Provided similar privileges are accorded licentiates of District of Columbia by licensing agency of the jurisdiction from which the applicant comes.
7. Senior year in class A medical school in United States.
8. Effective May 1939.
9. Reciprocity applicants only.
10. Application must be filed six months prior to date of examination.
11. Licensed to practice medicine and surgery in country in which school of graduation is located.
12. Diplomates of National Board of Medical Examiners eligible for licensure only.
13. At the discretion of the board.
14. Internship and one year graduate work.
15. After July 1, 1939.
16. Applicants from schools in England and Scotland only.
17. Internship completed in foreign countries after July 1, 1934, not acceptable.
18. Rotating internship in approved hospital in the United States or completion of senior year in class A medical school in the United States.
19. These requirements apply also to graduates of Canadian schools.
20. Clinical examination required.
21. Examination fee, Lansing and Ann Arbor $25; Detroit $35.
22. Applies to graduates of Canadian schools. Others not accepted.

In most states all foreign credentials must be visaed by the American consul.

TABLE 24.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1939*

Marginal Number		1 California	2 Connecticut	3 Florida	4 Georgia	5 Idaho	6 Illinois	7 Indiana	8 Iowa	9 Maine	10 Maryland	11 Massachusetts	12 Missouri	13 Montana	14 New Hampshire	15 New Jersey	16 New Mexico	17 New York	18 North Dakota	19 Ohio	20 Pennsylvania	21 Rhode Island	22 Tennessee	23 Texas	24 Vermont	25 Virginia	26 Washington	27 Hawaii and Puerto Rico	Totals	Examined—Passed	Examined—Failed	Percentage Failed	No. of Boards Examined by	Marginal Number
		P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
	BELGIUM																																	
1	Université Libre de Bruxelles						1 0					2 0				1 0													4	2	1	25.0	2	1
2	Université de Liège						1 0					1 1																	2	1	1	50.0	1	2
3	Universiteit Gent																																	
	CZECHOSLOVAKIA																																	
4	Deutsche Universität, Prag	0 1			1 0 0 1	2 0						3 2						17	19		2 0								40	26	23	47.0	7	4
5	Masarykova Universita, Brno											1 0																	1	1	0	0.0	1	5
6	Universita Karlova, Praha	0 1																1	4										6	1	5	83.3	2	6
7	Univerzita Komenského, Bratislava						1 1														1 0								3	2	1	33.3	2	7
	ENGLAND																																	
8	University of Durham																	1 0											1	1	0	0.0	1	8
9	University of Sheffield																	1 0											1	1	0	0.0	1	9
10	Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	2 0																5 2											9	7	2	22.2	2	10
	ESTONIA																																	
11	Université de Tartu											0 1																	1	0	1	100.0	1	11
	FRANCE																																	
12	Université de Lyon																	1 1											2	1	1	50.0	1	12
13	Université de Montpellier																	1 0		0 1								1 0	3	2	1	33.3	3	13
14	Université de Nancy						1 0											1 3											5	2	3	60.0	2	14
15	Université de Paris						2 1					0 1				1 0		8 5		1 0		1 0						1 1	22	14	8	36.4	7	15
16	Université de Strasbourg																	1 0											1	1	0	0.0	1	16
	GERMANY																																	
17	Albert-Ludwigs-Universität, Freiburg	2 1 0 1					3 1					2 0				1 1		10	10		1 0								23	19	14	42.4	7	17
18	Albertus-Universität, Königsberg	0 1										0 1				0 1		3 7		1 1									15	4	11	73.3	3	18
19	Christian-Albrechts-Universität, Kiel						2 0				1 1							2 2		1 0 2				1 1				14	7	7	50.0	6	19
20	Eberhard-Karls-Universität, Tübingen	0 1																1 1											3	1	2	66.7	2	20
21	Ernst-Moritz-Arndt-Universität, Greifswald															0 1													1	0	1	100.0	1	21
22	Friedrich-Alexanders-Universität, Erlangen	1 0 0 1 0 1										7 1	1 0			1 1		1 2		1 0 0 1									11	4	7	63.6	7	22
23	Friedrich-Wilhelms-Universität, Berlin	2 0 1 1					10 1		0 1			7 1	1 0			1 0		82 77		8 2 1 1				0 1		1 0 2 0 1 0			193	101	92	48.2	10	23
24	Georg August-Universität, Göttingen	0 2								0 1		1 1						4 6											15	5	10	66.7	4	24
25	Hamburgische Universität	0 1					0 1					1 1						8 10		1 0 2 0				1 1					27	13	14	51.9	7	25
26	Hessische Ludwigs-Universität, Giessen										1 0					1 0		4 7		1 0									14	7	7	50.0	4	26
27	Johann Wolfgang Goethe-Universität, Frankfurt-am-Main	1 1 0 1					1 0					2 0				0 1		17 15											39	21	18	46.2	6	27
28	Julius-Maximilians-Universität, Würzburg						2 0 1 0					1 0				1 1		12 19		2 0									50	19	29	58.0	6	28
29	Kaiser-Wilhelms-Universität, Strassburg											1 0						4 5		2 0									12	7	5	41.7	3	29
30	Karl-Franzens-Universität, Graz															0 2		1 3											6	1	5	83.3	2	30
31	Leopold-Franzens-Universität, Innsbruck																	1 0											1	1	0	0.0	1	31
32	Ludwig-Maximilians-Universität, München	2 1 0 2				0 1	4 0					3 1				2 1		21 27		4 1									70	36	34	48.6	9	32
33	Medizinische Akademie Düsseldorf						1 0											0 2											4	2	2	50.0	2	33
34	Philipps-Universität, Marburg										0 1	1 0				0 1		2 3											5	2	3	60.0	2	34
35	Rheinische Friedrich-Wilhelms-Universität, Bonn					0 1	1 0 1 0					1 0				0 1		9 13		3 0 1 0							1 0		32	17	15	46.9	9	35
36	Schlesische Friedrich-Wilhelms-Universität, Breslau	1 2				0 1	3 1					2 0				2 5		18 23		1 0				1 0					62	28	34	54.8	8	36
37	Thüringische Landesuniversität, Jena																	0 1		0									1	1	0	0.0	1	37
38	Universität Heidelberg	1 1 0 2					2 2				1 0 1 1					1 0		17 29		2 0 2 0									59	27	32	54.2	9	38
39	Universität Köln						2 1									2 5		6 1		1 0									11	9	2	18.2	3	39
40	Universität Leipzig	0 1					2 0											7 12		1 0					1 0				30	14	16	53.3	6	40
41	Universität Rostock	1 0 0 1				0 1					0 1							0 2		1 0						0 1			6	2	4	75.0	2	41
42	Universität Wien	7 1 3 9				0 1	2 9 4		2 0 0 2		6 422	3 1 0 1	0		13 22		115 176		9 2 6 1				1 0					422	307	225	52.0	15	42
43	Vereinigten Friedrichs-Universität, Halle-Wittenberg	0 1					2 0									2 2		0 6		1 1				1 0					16	6	10	62.5	6	43
	GREECE																																	
44	National University of Athens	0 1								0 1		0 1						0 1											4	0	4	100.0	4	44

| | | |

TABLE 25.—*Physicians Examined by Licensing Boards of the United States and Possessions on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1934-1939*

	1934-1938		1939	
	Number Examined	Percentage Failed	Number Examined	Percentage Failed
AUSTRALIA				
University of Adelaide	1	0.0	0	0.0
University of Sydney	1	0.0	0	0.0
BELGIUM				
Université Catholique de Louvain	4	50.0	0	0.0
Université de Liége	5	60.0	1	0.0
Université Libre de Bruxelles	3	0.0	4	25.0
Universiteit Gent	2	100.0	2	50.0
CHILE				
Universidad de Chile, Santiago	2	0.0	0	0.0
CHINA				
Pennsylvania Medical School, Shanghai	5	20.0	0	0.0
Women's Christian Medical College, Shanghai	1	0.0	0	0.0
CHOSEN (KOREA)				
Severance Union Medical College, Keijo	2	100.0	0	0.0
CUBA				
Universidad de la Habana	15	53.8	0	0.0
CZECHOSLOVAKIA				
Deutsche Universität, Prag	26	30.8	49	67.0
Masarykova Universita, Brno	4	75.0	1	0.0
Universita Karlova, Praha	8	75.0	6	83.3
Univerzita Komenského, Bratislava	4	50.0	3	33.3
ENGLAND				
Fellow of the Royal College of Physicians of London	1	0.0	0	0.0
Licentiate in Medicine, Surgery and Midwifery of the Apothecaries' Society of London	5	60.0	0	0.0
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Physicians of London	2	50.0	0	0.0
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	64	7.8	9	22.2
University of Birmingham	3	0.0	0	0.0
University of Bristol	2	0.0	0	0.0
University of Cambridge	1	0.0	0	0.0
University of Durham, Newcastle-upon-Tyne	4	25.0	1	0.0
University of Liverpool	1	0.0	0	0.0
University of London	8	37.5	0	0.0
University of Oxford	1	0.0	0	0.0
University of Sheffield	8	0.0	1	0.0
ESTONIA				
Université de Tartu	1	100.0	1	100.0
FRANCE				
Université de Bordeaux	2	50.0	0	0.0
Université de Lyon	5	60.0	2	50.0
Université de Montpellier	5	20.0	3	33.3
Université de Nancy	1	100.0	5	60.0
Université de Paris	107	36.4	22	36.4
Université de Strasbourg	4	0.0	1	0.0
Université de Toulouse	5	20.0	0	0.0
GERMANY				
Albert-Ludwigs-Universität, Freiburg	58	34.5	31	42.4
Albertus-Universität, Königsberg	35	45.7	15	73.3
Christian-Albrechts-Universität, Kiel	7	28.6	14	50.0
Eberhard-Karls-Universität, Tübingen	16	44.4	5	60.7
Ernst Moritz-Arndt Universität Greifswald	2	50.0	1	100.0
Friedrich-Alexanders-Universität, Erlangen	17	64.7	11	63.6
Friedrich-Wilhelms-Universität, Berlin	325	34.5	195	68.2
Georg August-Universität, Göttingen	12	33.3	15	66.7
Hamburgische Universität	56	19.6	27	51.9
Hessische Ludwigs-Universität, Giessen	11	27.2	14	50.0
Johann Wolfgang Goethe-Universität, Frankfurt-am-Main	66	33.3	39	66.2
Julius Maximilians-Universität, Würzburg	56	42.9	39	51.3
Kaiser-Wilhelms-Universität, Strassburg	9	44.4	12	41.7
Karl-Franzens-Universität, Graz	21	38.1	6	83.3
Leopold-Franzens-Universität, Innsbruck	9	33.3	1	0.0
Ludwig-Maximilians-Universität, München	117	33.3	70	68.6
Medizinische Akademie Düsseldorf	14	42.8	4	50.0
Philipps-Universität, Marburg	4	50.0	5	60.0
Rheinische Friedrich-Wilhelms-Universität, Bonn	31	45.2	32	46.9
Schlesische Friedrich-Wilhelms-Universität, Breslau	65	31.8	62	54.8
Thüringische Landesuniversität, Jena	7	28.6	3	66.7
Universität Heidelberg	82	28.0	39	54.2
Universität Köln	32	37.5	11	18.2
Universität Leipzig	44	45.5	30	53.3
Universität Rostock	15	40.0	6	75.0
Universität Wien	317	27.1	432	52.0
Vereinigten Friedrichs-Universität, Halle Wittenberg	4	25.0	16	62.5
Westfälische Wilhelms-Universität, Münster	3	66.7	0	0.0
GREECE				
National University of Athens	15	80.0	4	100.0
GUATEMALA				
Universidad Nacional de Guatemala	2	50.0	0	0.0
HUNGARY				
Magyar Királyi Erzsébet Tudományegyetem, Pecs	4	50.0	10	70.0
Magyar Királyi Ferenc József Tudományegyetem, Szeged	7	42.9	2	50.0
Magyar Királyi Pázmány Petrus Tudományegyetem, Budapest	38	34.2	26	61.5
Magyar Királyi Tisza István-Tudományegyetem, Debrecen	2	50.0	1	0.0
IRAN (PERSIA)				
Government Medical School, Teheran	1	100.0	0	0.0
IRELAND				
Licentiate of the Royal College of Physicians of Ireland and Licentiate of the Royal College of Surgeons in Ireland	3	33.3	2	50.0
National University of Ireland	7	42.9	1	0.0
Queen's University, Belfast	0	0.0	1	0.0
University of Dublin	12	25.0	0	0.0
ITALY				
Regia Università di "Benito Mussolini" di Bari	1	0.0	1	100.0
Regia Università di Bologna	65	30.8	37	75.7
Regia Università di Catania	2	50.0	0	0.0
Regia Università di Firenze	10	40.0	9	33.3
Regia Università di Genova	10	60.0	6	66.7
Regia Università di Messina	4	100.0	4	100.0
Regia Università di Milano	6	66.7	4	50.0
Regia Università di Modena	11	72.7	2	100.0
Regia Università di Napoli	147	30.2	38	72.2
Regia Università di Padova	23	56.5	2	50.0
Regia Università di Palermo	16	68.8	4	100.0
Regia Università di Pavia	2	50.0	0	0.0
Regia Università di Perugia	4	25.0	1	100.0
Regia Università di Pisa	12	50.0	4	75.0
Regia Università di Roma	233	50.2	62	56.5
Regia Università di Siena	8	62.5	6	83.3
Regia Università di Torino	2	0.0	2	0.0
JAPAN				
Japan Medical College, Tokyo	2	100.0	1	100.0
Japan University Medical Department, Tokyo	0	0.0	1	100.0
LATVIA				
Latvijas Universitäte, Riga	1	100.0	1	100.0
LEBANON				
American University of Beirut	4	0.0	2	0.0
Université de St. Joseph, Beyrouth	2	50.0	0	0.0
MEXICO				
Escuela Libre de Homeopatia del Estado de Puebla	1	100.0	0	0.0
Escuela Médico Militar, México, D.F.	5	80.0	0	0.0
Instituto Literario y Científico, San Luis Potosí	1	100.0	0	0.0
Universidad Nacional, México, D.F.	10	60.0	3	100.0
NETHERLANDS				
Rijks-Universiteit te Leiden	3	0.0	0	0.0
Rijks-Universiteit te Utrecht	1	0.0	0	0.0
Universiteit van Amsterdam	1	0.0	1	0.0
POLAND				
Uniwersytet Jana Kazimierza, Lwów	4	50.0	3	33.3
Uniwersytet Josefa Pilsudskiego, Warszawa	2	50.0	3	66.7
Uniwersytet Stefana Batorego, Wilno	1	0.0	1	100.0
PORTUGAL				
Universidade de Lisboa	4	75.0	0	0.0
RUMANIA				
Universitatea din Bucuresti	2	50.0	0	0.0
Universitatea Regele Ferdinand I-iu din Cluj	4	50.0	3	33.3
SCOTLAND				
Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow	1	0.0	0	0.0
Licentiate of the Royal College of Physicians of Edinburgh	1	0.0	0	0.0
Licentiate of the Royal College of Physicians of Edinburgh and Licentiate of the Royal College of Surgeons of Edinburgh	8	0.0	0	0.0
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow	181	29.4	57	14.0
School of Medicine of the Royal Colleges, Edinburgh	1	0.0	0	0.0
University of Aberdeen	11	9.1	0	0.0
University of Edinburgh	52	11.5	8	0.0
University of Glasgow	39	0.0	1	0.0
University of St. Andrews	74	12.2	1	0.0
SOUTH AFRICA, UNION OF				
University of Cape Town	1	0.0	0	0.0
SPAIN				
Universidad Central de España, Madrid	4	25.0	0	0.0
Universidad de Santiago	1	0.0	0	0.0
SWITZERLAND				
Universität Basel	103	36.2	27	51.9
Universität Bern	103	34.4	39	35.3
Universität Zürich	94	29.8	15	60.0
Université de Genève	85	32.6	19	63.1
Université de Lausanne	71	32.4	27	40.7
TURKEY				
University of Istanbul	2	100.0	0	0.0
UNION OF SOCIALIST SOVIET REPUBLICS				
First Moscow Medical Institute	2	50.0	0	0.0
Kharkov Medical Institute	2	50.0	0	0.0
Kiev Medical Institute	4	75.0	1	100.0
Military Medical Academy, Leningrad	1	100.0	0	0.0
Saratov Medical Institute	3	66.7	0	0.0
Second Leningrad Medical Institute	1	0.0	1	100.0
Second Moscow Medical Institute	0	0.0	1	0.0
Tomsk Medical Institute	1	0.0	0	0.0
Voronezh Medical Institute	0	0.0	1	100.0
YUGOSLAVIA				
Beogradskog Univerziteta	2	50.0	0	0.0
Zagrebashog Universiteta	1	0.0	0	0.0

(CONTINUED FROM PAGE 1659)

states which licensed more than five graduates are indicated in black on the chart; those shaded, five or less. Thirteen states registered more than five, sixteen less than five. These twenty-nine states altogether registered 925.

TABLE 26.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1930-1938*

Year	Number Examined	Passed	Percentage Failed
1930	167	92	44.9
1931	156	91	41.4
1932	182	95	47.3
1933	200	129	35.5
1934	295	170	40.2
1935	457	295	35.7
1936	588	382	35.0
1937	959	637	33.5
1938	1,161	716	38.3
1939	1,692	939	38.4
Totals	5,792	3,455	38.6

In table 25 are assembled figures showing the standing during the five year period 1934-1938 of the graduates of faculties of medicine outside the United States and Canada admitted to licensing examinations in this country. Included also is a tabulation for 1939. There were represented 129 foreign faculties and nine of the licensing corporations of Great Britain. During the five year period 3,395 were examined and in 1939, 1,692. The largest number from any one school in the five year period was the University of Berlin, 325, of whom 34.5 per cent failed. There were 316 from the University of Vienna with 27.1 per cent failures.

Table 26, the last in this group of statistics, records the number of graduates of faculties of medicine abroad examined in the United States in the ten years 1930 to 1939 inclusive. There were 529 more examined in 1939 than in 1938 and 1,525 more than in 1930. During the ten year period 5,792 were examined, of whom 3,455 passed and 38.6 per cent failed.

The Council on Medical Education and Hospitals does not grade or classify medical schools outside the United States and Canada. No opportunity is afforded for visiting and inspecting such schools, nor are official reports received from them. The Council therefore has no evidence on which to base a rating. A list of foreign schools which has been published from time to time merely serves as a key to the American Medical Directory and indicates the names of the institutions which physicians now licensed to practice in the United States attended or from which they graduated.

ANNUAL REGISTRATION

Twenty-one states, Alaska and Hawaii, as shown in table 27, require that all physicians licensed register annually, whether or not they reside in the state.

TABLE 27.—*Annual Registration*

Alaska	Louisiana
Arizona	Minnesota
Arkansas	Nebraska
California	Nevada
Colorado	New York
Connecticut	North Dakota
Florida	Oregon
Georgia	Pennsylvania
Hawaii	Texas
Iowa	Utah
Idaho	Wyoming
Kansas	

Four states—Alabama, Delaware, Mississippi and North Carolina—require physicians to pay annually an occupational or commercial tax. The fee for this registration is generally $2.

EXAMINING BOARDS IN MEDICAL SPECIALTIES

The House of Delegates of the American Medical Association at its annual session in 1933 passed the following resolution:

Resolved, That the Council on Medical Education and Hospitals is hereby authorized to express its approval of such examining boards in medical specialties as conform to the standards of administration formulated by the Council; and be it further

Resolved, That the Board of Trustees of the American Medical Association be urged to use the machinery of the American Medical Association, including the publication of its directory, in furthering the work of such examining boards as may be accredited by the Council.

Standards were formulated by the Council and approved by the House of Delegates, June 11-15, 1934. Fourteen boards have to date been approved, and those certified, with the exception of plastic surgery, will be identified in the sixteenth edition of the American Medical Directory now in process of compilation, by the key A. B. 1, 2, and so on. The American Board of Plastic Surgery has expressed the desire not to credit

Certificates Awarded by Examining Boards in Medical Specialties

Key A. B.	Name of Board	Year	Certificates Awarded (Active Diplomates)
1.	American Board of Pediatrics	1933	1,470
2.	American Board of Psychiatry and Neurology	1934	832
3.	American Board of Orthopaedic Surgery	1934	652
4.	American Board of Dermatology and Syphilology	1932	492
5.	American Board of Radiology	1934	1,404
6.	American Board of Urology	1935	677
7.	American Board of Obstetrics and Gynecology	1930	1,051
8.	American Board of Internal Medicine	1935	2,158
9.	American Board of Pathology	1936	706
10.	American Board of Ophthalmology	1917	1,706
11.	American Board of Otolaryngology	1924	2,977
12.	American Board of Surgery	1937	1,274
13.	American Board of Anesthesiology	1937	86
14.	American Board of Plastic Surgery	1937	112
	Total		15,597

in the sixteenth edition of the Directory its diplomates until all eligible have had opportunity to receive certification. The key number of the boards, the year incorporated and the number of certificates awarded to date appear in the accompanying tabulation. The number certified by some of the boards has been reduced by death. Recorded therefore are the active diplomates.

To date 15,597 have been certified in fourteen specialties. Each of these boards has published a booklet containing a brief statement regarding its organization, personnel, purposes and qualifications for eligibility for certification, which is available on request to the officers of these boards or to the American Medical Association.

BASIC SCIENCE BOARDS

A certificate in the basic sciences is a prerequisite for licensure in fourteen states and the District of Columbia. Some of these states have reciprocal agreements, but the certificate is obtainable after examination in the majority of instances. Boards for the certification of candidates functioned in thirteen states and the District of Columbia in 1939, namely Arizona, Arkansas, Colorado, Connecticut, Florida, Iowa, Minnesota, Nebraska, Oklahoma, Oregon, South Dakota, Washington and Wisconsin. Basic science requirements were established in Michigan but no examinations were given

in 1939 because of an injunction suit which was decided in favor of the board early in 1940 and examinations will be given during 1940. The basic science law in South Dakota went into effect Oct. 1, 1939. Florida enacted a law June 12, 1939, which became effective ninety days thereafter. The years in which the various acts were enacted are shown in table 1.

TABLE 1.—*States Having Basic Science Laws and Year of Enactment*

Arizona	1933	Minnesota	1927
Arkansas	1929	Nebraska	1927
Colorado	1927	Oklahoma	1927
Connecticut	1925	Oregon	1933
District of Columbia	1929	South Dakota	1939
Florida	1939	Washington	1927
Iowa	1925	Wisconsin	1925
Michigan	1927		

Statistics based on the number of candidates certified in 1939 and those who failed to receive certification, together with the totals for other years shown for comparison, are included in the accompanying tables. Similar data have been published in the State Board Number of THE JOURNAL since 1928.

The subjects in which examinations are conducted in the respective states and the District of Columbia are given in table 2. The subjects included in basic science examinations are specified by the statutes. The examination boards may neither add to nor subtract from such subjects. All boards examine in anatomy, pathology and physiology; thirteen examine in chemistry, eleven in bacteriology, seven in hygiene, two in diagnosis and one in hygiene and public health.

Applicants examined during 1939 in the various groups—physicians, osteopaths, chiropractors and those unclassified—are included in table 3. The fourteen boards functioning in 1939 examined 1,359 candidates. Of this number 1,141 were doctors of medicine, 114 osteopaths and twenty-seven chiropractors; for seventy-

TABLE 2.—*Subjects of Examinations*

	Examinations Required in							
	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology	Hygiene and Public Health
Arizona	+	+	+	..	+	+	+	..
Arkansas	+	+	+	..	..	+	+	..
Colorado	+	+	+	..	..	+	+	..
Connecticut	+	..	..	+	+	+	+	..
Dist. Columbia	+	+	+	..	..	+	+	..
Florida	+	+	+	..	..	+	+	..
Iowa	+	+	+	..	+	+	+	..
Michigan	+	+	+	..	..	+	+	+
Minnesota	+	+	+	..	+	+	+	..
Nebraska	+	+	+	..	+	+	+	..
Oklahoma	+	+	+	..	..	+	+	..
Oregon	+	..	+	..	+	+	+	..
South Dakota	+	+	+	..	..	+	+	..
Washington	+	..	+	..	+	+	+	..
Wisconsin	+	..	..	+	..	+	+	..

seven it was not possible to determine what profession they represented. In applying for a basic science certificate it is not necessary in several of the states to mention the school of practice, but by checking the biographic records of the American Medical Association it has been possible to determine what profession the majority of the candidates represented. The remainder compose the unclassified group. Of all examined, 1,110 passed and 249 failed, 18.3 per cent. Of all physicians examined, 11.2 per cent failed, of the osteopaths 43.9 per cent failed, of the chiropractors 77.8 per cent, and of those unclassified, 65 per cent. Among those passed there were 1,013 physicians, sixty-four osteopaths, six chiropractors and twenty-seven unclassified. Minnesota examined the largest number, 268 of whom, 21.6 per cent, failed. The next largest number, 185, were examined in Wisconsin, with 4.3 per cent failures. Osteopaths were examined in Arkansas, Colorado, Connecticut, Iowa, Minnesota, Nebraska, Oregon, Washington and Wisconsin. In fact, osteopaths were examined in every state except Arizona, District of Columbia, Florida, Oklahoma and South Dakota. Chiropractors were examined in Connecticut, Iowa, Minnesota, Oklahoma, Washington and Wisconsin. None were examined in Arizona, Arkansas, Colorado, District of Columbia, Florida, Nebraska, Oregon and South Dakota. The highest percentage of failures, 43.1, was in Iowa, which examined thirty-three physicians, forty-four osteopaths, seven chiropractors and twenty-five unclassified candidates.

TABLE 3.—*Applicants Examined, 1939*

	Physicians or Medical Students		Osteopaths		Chiropractors		Unclassified		Total Examined	Passed	Failed	Percentage Failed
	P	F	P	F	P	F	P	F				
Arizona	37	0	0	0	0	0	0	18	55	37	18	32.7
Arkansas	64	0	7	4	0	0	0	0	75	71	4	5.3
Colorado	24	0	4	2	0	0	1	0	31	29	6	21.6
Connecticut	129	9	1	1	1	2	0	0	143	131	12	8.4
District of Columbia	29	7	0	0	0	0	0	0	36	29	7	19.4
Florida	34	6	0	0	0	0	0	0	40	34	6	15.0
Iowa	25	8	24	20	1	4	12	13	109	62	47	43.1
Minnesota	196	42	6	5	2	1	6	10	268	210	58	21.6
Nebraska	70	23	1	5	0	0	1	0	98	72	26	26.5
Oklahoma	65	4	0	0	0	1	0	0	70	65	5	7.1
Oregon	68	15	2	3	0	0	6	6	100	76	24	24.0
South Dakota	2	0	0	0	0	0	0	0	2	2	0	0.0
Washington	113	30	2	4	0	11	0	1	141	115	26	18.4
Wisconsin	157	0	17	6	2	0	1	2	185	177	8	4.3
Totals—Examined	1,141		114		27		77		1,359			
Totals—Passed	1,013		64		6		27		.....	1,110		
Totals—Failed	128		50		21		50		.....	.....	249	
Percentage—Failed	11.2		43.9		77.8		65.0		.....	.....	...	18.3

The number of certificates granted by examination, reciprocity and endorsement are recorded in table 4. A total of 1,110 certificates were granted after examination; 1,013 were issued to physicians, sixty-four to osteopaths, six to chiropractors and twenty-seven to persons who were unclassified. There were also 1,021 certified without examination, by reciprocity and endorsement, consisting of 727 physicians, 125 osteopaths, 164 chiropractors and five who were unclassified. South Dakota, which enacted its law in 1939, registered 734 without examination, 470 physicians, 104 osteopaths and 160 chiropractors, representing apparently all those in practice in the state when the law became effective Oct. 1, 1939. Other than this state, Iowa accepted the greatest number without examination, seventy, of whom sixty-seven were physicians, two osteopaths and one was unclassified. Arizona, Connecticut, Florida, Oklahoma and Washington licensed none without examination. Arizona, Florida and Washington have no reciprocal agreements. Chiropractors and those unclassified were each licensed without examination in three states. Altogether 2,131 individuals received basic science certificates in 1939 in fourteen states, ranging from thirty-seven in Arizona to 736 in South Dakota.

Table 5 shows the number of candidates examined, or certified by reciprocity or endorsement, from 1927 to 1939 inclusive. In 1928, when five boards were functioning, there were 646 physicians examined, of whom sixty, or 9.3 per cent, failed, and fifty-nine other practitioners, of whom twenty-eight, or 47.5 per cent,

TABLE 4.—*Certificates Issued by Examination, Reciprocity and Endorsement, 1939*

	Examination					Reciprocity and Endorsement					
	Physicians or Med. Students	Osteopaths	Chiropractors	Unclassified	Totals	Physicians or Med. Students	Osteopaths	Chiropractors	Unclassified	Totals	Registered
Arizona	37	0	0	0	37	0	0	0	0	0	37
Arkansas	64	7	0	0	71	28	7	0	0	35	106
Colorado	24	4	0	1	29	9	1	3	0	13	42
Connecticut	129	1	1	0	131	0	0	0	0	0	131
District of Columbia	29	0	0	0	29	29	0	0	0	29	58
Florida	34	0	0	0	34	0	0	0	0	0	34
Iowa	25	24	1	12	62	67	2	0	1	70	132
Minnesota	196	6	2	6	210	48	1	0	0	49	259
Nebraska	70	1	0	1	72	13	0	0	0	13	85
Oklahoma	65	0	0	0	65	0	0	0	0	0	65
Oregon	68	2	0	6	76	9	7	0	2	18	94
South Dakota	2	0	0	0	2	470	104	160	0	734	736
Washington	113	2	0	0	115	0	0	0	0	0	115
Wisconsin	157	17	2	1	177	54	9	1	2	66	237
Totals	1,013	64	6	27	1,110	727	125	164	5	1,021	2,131

failed. In 1939, 1,740 physicians and 391 other practitioners were certified. During the thirteen year period a total of 10,511 physicians were examined, of whom 1,250, 11.9 per cent, failed and 1,149 other practitioners, of whom 628, 54.7 per cent, failed. During this period 2,258 physicians were certified without examination, while only 386 other practitioners, including 294 endorsed in South Dakota in 1939, were so registered.

Altogether, 12,426 certificates have been issued by basic science boards since 1927, of whom 11,519 were

TABLE 5.—*Total Candidates, 1927-1939*

		Physicians or Medical Students						Other Practitioners					
		Examinations						Examinations					
	Number of Boards	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified	Examined	Passed	Failed	Percentage Failed	Endorsement	Total Certified
1927	5	385	279	26	8.5	26	305	22	15	7	31.8	1	16
1928	5	646	586	60	9.3	19	605	59	31	28	47.5	0	31
1929	7	668	610	58	8.7	75	685	66	31	35	53.0	0	31
1930	7	685	606	79	11.5	118	724	78	30	48	61.5	4	34
1931	7	690	549	94	13.6	141	727	107	48	59	55.1	0	48
1932	7	657	590	67	10.2	108	698	78	44	34	43.6	12	56
1933	8	601	527	74	12.3	120	647	60	30	30	50.0	11	41
1934	9	615	725	90	11.0	127	852	51	26	25	49.0	11	37
1935	10	882	761	121	13.7	110	871	74	33	41	55.4	4	37
1936	10	1,022	901	141	13.7	230	1,131	66	26	40	60.6	23	49
1937	12	1,251	1,061	170	13.5	192	1,253	113	41	72	63.7	10	51
1938	13	1,168	1,026	142	12.2	267	1,293	157	69	88	56.1	28	95
1939	14	1,141	1,013	128	11.2	727	1,740	218	97	121	55.5	294	391
Totals		10,511	9,301	1,250	11.9	2,258	11,519	1,149	521	628	54.7	386	907

granted to physicians and 907 to other practitioners. From the high percentage of failures in the other practitioner group it seems apparent that the enforcement of basic science laws affects mostly this group. The object of basic science boards is to provide a means of insuring that all candidates seeking the right to care for sick and injured people shall first possess a reasonable knowledge of the sciences fundamental to the healing art.

NATIONAL BOARD OF MEDICAL EXAMINERS

This year marks the twenty-fifth anniversary of the organization of the National Board of Medical Examiners. When the Board was founded in 1915 by Dr. William L. Rodman, he stated its aims and purposes to be "to establish a standard of examination and certification of graduates in medicine for the whole United States and its territories through which by the cooperation of the state and territorial boards of medical examiners its licentiates may be recognized for licensure to practice medicine." It consists at present of twenty-eight members, including the three surgeon generals of the United States Army, Navy and Public Health Service and one other representative from each of those services, four representatives and one former representative of state licensing boards, two members of the Council on Medical Education and Hospitals of the American Medical Association, three representatives of the Association of American Medical Colleges and twelve members appointed at large.

The preparation for and participation in the World War by the United States materially interfered with the early development of the work of the National Board,

TABLE 1.—*Examinations, 1916-1921*

Date	Total Examined	Passed	Failed	Percentage Failed
October 1916	10	5	5	50.0
June 1917	12	9	3	25.3
October 1917	28	22	6	21.5
January 1918	20	18	2	10.0
April 1918	23	18	5	20.1
December 1918	18	15	3	6.3
June 1919	52	51	1	1.9
February 1920	48	36	12	25.0
May 1920	69	55	14	20.3
February 1921	16	11	5	31.3
June 1921	40	37	3	7.5
Totals	325	280	57	14.3

but since 1922 the number obtaining its certificate has been steadily increasing. The greatest accomplishment has been the acceptance of the certificate as a qualification for licensure by forty-three states, the District of Columbia and four territories.

Statistics are herewith presented regarding the examinations of and the issuance of certificates by the National Board of Medical Examiners. Similar material has been presented in the State Board Number of THE JOURNAL for twenty-two years.

Up to Dec. 31, 1921, eleven examinations were held and 268 candidates were certified. In table 1 are recorded the results for each examination since 1916.

In 1922 the National Board, following a careful study of the detailed report of a commission appointed to study the methods for medical licensure in England, Scotland and France, and also through exchange visits, materially changed its examination plans. The examinations were divided into three parts. Part I, a written examination, covers the work of the first two years of the medical course; part II, likewise a written examination, the work of the last two years, and part III the clinical preparation of the candidate after at least one year's internship.

The data included in the following paragraphs refer to the examination and the issuance of certificates to candidates applying since 1922 and include tables enumerating the results of examinations in parts I, II and III for each calendar year, indicating those who passed and failed examinations, and those certified.

Candidates are required to take all six subjects of part I at a regular examination period unless entitled to take an incomplete examination or electing to take a divided examination. An incomplete examination is arranged for candidates taking part I at the end of their second medical year in schools in which the third year curriculum includes courses in one or two subjects of this part. The subjects thus postponed may be taken at any examination period after the candidate has completed them in his medical school. Any candidate not entitled to take an incomplete examination in part I may, if he so elects, take a divided examination by writing any four subjects at one time and the remaining two within thirteen months, but after at least one semester of study. Incomplete examinations were not included when percentages were being computed, since they represent neither a candidate eligible for certification nor a failure.

A candidate who fails to make an average of 75 per cent but has received grades of at least 75 per cent in three or more main divisions is required to repeat those divisions, either in whole or in part, in which he received grades below 75 per cent. Grades below 60 per cent in any of the subdivisions are not acceptable if the grade for the corresponding main division is under 75 per cent. In such case the candidate is "referred" in this subdivision and required after a three months interval to pass a reexamination. The privilege of a second reexamination is determined in each case by the board. "Referred" candidates are likewise excluded from the statistics.

Three examinations in part I were held in 1939. Table 2 contains the results of these examinations together with totals for seventeen years. During 1939, 1,734 examinations were given; 1,048 candidates passed, 460 were given incomplete examinations and 225, 17.7 per cent, failed.

Four examinations were given in part II, figures for which appear in table 3. Altogether 938 were so examined; 884 passed and fifty-four, 5.8 per cent, failed.

Since 1922 a total of 19,109 examinations have been given in part I and 10,056 in part II. From 1922 to 1939 inclusive, 12,064 were successful in passing part I and 9,133 in passing part II. The figures cover the totals of each examination given during a calendar year and include some who fail and are reexamined during the same year and also some who pass parts I and II in the same year. They represent therefore examinations conducted rather than individuals examined. In the eighteen year period since 1922 there have been 2,005 failures in part I, 14.3 per cent, and 887 in part II, 8.9 per cent.

The results of examinations in part III for the eighteen year period 1922 to 1939 inclusive are presented in table 4. In 1939, 770 were examined, as compared with only twenty-two in 1922. Of those examined in 1939, forty-one, or 5.3 per cent, failed. The highest percentage of failures was in 1927, when 293 were examined and twenty-one, 7.2 per cent, failed. In eighteen years 7,514 were examined, of whom 7,169 were granted certificates and 345, 4.6 per cent, failed. Here again a candidate having failed may subsequently receive a certificate in the same year.

From 1916 to 1921, when the examination was not given in three parts, 325 were examined, of whom 268 passed and fifty-seven, 14.3 per cent, failed.

Altogether from 1916 up to and including 1939, 7,437 certificates have been granted.

The number of persons examined during any one year is given in table 5. The classification as passed or failed, in cases in which more than one examination has been taken in a given year, was based on the results of the last examination during the year in question.

TABLE 2.—*Examinations in Part I in 1939 and 1922-1939*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February	288	161	17	39	14.8
June	1,046	626	254	167	16.0
September	440	221	189	79	24.1
Totals	1,734	1,048	460	225	17.7
1922	2[illegible]	203	58	67	20.3
1923	[illegible]4	349	77	81	18.8
1924	731	415	69	107	20.5
1925	699	499	80	156	20.3
1926	625	436	104	85	16.3
1927	702	452	159	91	16.8
1928	843	533	231	79	12.9
1929	1,090	675	331	90	11.8
1930	1,320	901	345	114	12.5
1931	1,277	755	425	97	11.4
1932	1,397	947	371	89	9.5
1933	1,234	702	316	136	14.8
1934	1,341	909	347	85	9.5
1935	1,284	765	410	69	8.1
1936	1,344	908	383	123	12.5
1937	1,435	971	415	149	14.6
1938	1,653	985	568	100	14.9
1939	1,734	1,048	460	225	17.7
Totals	19,109	12,084	5,079	2,005	14.3

TABLE 3.—*Examinations in Part II in 1939 and 1922-1939*

Date	Total Examinations	Passed	Incomplete	Failed	Percentage Failed
February	163	149	0	14	8.6
May	468	451	0	17	3.6
June	222	206	0	16	7.2
September	85	78	0	7	8.2
Totals	938	884	0	54	5.8
1922	169	99	0	29	17.4
1923	192	170	2	20	10.5
1924	327	227	0	49	15.0
1925	342	299	0	43	9.6
1926	361	234	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	466	389	10	67	10.5
1930	499	443	7	79	11.4
1931	719	630	2	87	12.1
1932	722	674	0	58	7.9
1933	714	651	0	63	8.8
1934	633	583	0	50	7.9
1935	699	629	0	70	10.0
1936	709	716	2	30	6.5
1937	855	803	1	51	6.0
1938	861	815	0	46	5.3
1939	938	884	0	54	5.8
Totals	10,056	9,133	35	887	8.9

TABLE 4.—*Examinations in Part III*

	Total Examinations	Passed	Failed	Percentage Failed
1922	22	22	0	0.0
1923	82	81	1	1.2
1924	126	120	6	4.8
1925	219	206	13	5.9
1926	255	243	12	4.7
1927	293	272	21	7.2
1928	322	306	16	5.0
1929	352	337	15	4.3
1930	470	451	19	4.5
1931	437	419	18	4.1
1932	550	522	28	5.1
1933	551	526	25	4.5
1934	567	548	19	3.4
1935	598	578	20	3.3
1936	576	547	29	5.0
1937	669	630	39	5.7
1938	706	682	24	3.4
1939	770	729	41	5.3
Totals	7,514	7,169	345	4.6

Between 1916 and 1921 a total of 325 were examined, of whom 268 passed and 57, 14.3 per cent, failed. Total certificates awarded, 7,437.

For example, if in 1939 a candidate passed part I but later failed part II, he is listed as having failed. Taking this into consideration, there were 3,217 who took at least one of the examinations of the National Board of Medical Examiners during 1939, as compared with 525 in 1922. A total of 33,976 were examined in one or more of the examinations in the eighteen years shown, of whom 26,290 passed, 4,823 took incomplete examinations and 2,863, 9.8 per cent, failed.

Examinations in part III were held during 1939 at which 729 were successful. Graduates of sixty-four approved schools in the United States and four in

TABLE 5.—*Parts I, II and III, Excluding Duplications*

	Total Examined	Passed	Incomplete	Failed	Percentage Failed
1922	525	361	58	86	16.4
1925	775	594	79	102	14.7
1926	979	736	69	153	16.8
1925	1,167	915	50	202	18.1
1926	1,161	930	105	126	11.9
1927	1,248	947	142	159	14.4
1928	1,430	1,101	211	118	9.7
1925	1,721	1,289	319	124	8.8
1930	2,044	1,547	322	175	10.2
1931	2,216	1,632	410	176	9.7
1932	2,342	1,850	355	137	6.9
1933	2,277	1,808	280	191	9.6
1934	2,261	1,801	338	120	6.7
1935	2,388	1,831	408	129	6.6
1936	2,317	1,949	353	175	8.1
1937	2,735	2,151	307	187	8.0
1938	2,980	2,306	483	191	7.7
1939	3,217	2,473	442	302	10.9
Totals	33,976	26,290	4,823	2,863	9.8

TABLE 6.—*Diplomates from Individual Medical Schools, 1939*

	Certificates Awarded		Certificates Awarded
Univ. of Arkansas	3	Long Island Coll. of Med.	15
Coll. of Med. Evan.	80	N. Y. Med. Coll.	62
Stanford Univ.	3	New York Univ.	27
Univ. of California	2	Syracuse Univ.	1
Univ. of Southern Calif.	1	Univ. of Buffalo	5
Univ. of Colorado	10	Univ. of Rochester	2
Yale University	44	Duke Univ.	41
George Washington Univ.	16	Univ. of Cincinnati	2
Georgetown Univ.	34	Western Reserve Univ.	1
Howard Univ.	1	Univ. of Oklahoma	1
Emory Univ.	1	Univ. of Oregon	3
Univ. of Georgia	1	Hahnemann Med. Coll.	4
Loyola Univ.	6	Jefferson Med. Coll.	8
Northwestern Univ.	14	Temple Univ.	4
Rush Med. Coll.	20	Univ. of Pennsylvania	3
Univ. of Chicago	5	Woman's Med. Coll.	1
Univ. of Illinois	3	Med. Coll. of So. Car.	1
State Univ. of Iowa	3	Meharry Med. Coll.	2
Univ. of Kansas	1	Univ. of Tennessee	1
Univ. of Louisville	1	Vanderbilt Univ.	1
Louisiana State Univ.	2	Baylor Univ.	1
Tulane Univ.	3	Univ. of Texas	1
Johns Hopkins Univ.	10	Univ. of Vermont	17
Univ. of Maryland	3	Med. Coll. of Virginia	4
Boston Univ.	41	Univ. of Virginia	1
Harvard Med. Sch.	55	Marquette Univ.	8
Tufts Coll. Med. Sch.	53	Univ. of Wisconsin	1
Univ. of Michigan	5	McGill Univ.	5
Wayne Univ.	1	Univ. of Alberta	1
Univ. of Minnesota	9	Univ. of Toronto	3
St. Louis Univ.	10	Univ. of Western Ontario	1
Washington Univ.	4	Foreign	13
Creighton Univ.	2		
Univ. of Nebraska	1	Totals	739
Albany Med. Coll.	13		
Columbia Univ.	11		
Cornell Univ.	15		

Canada and thirteen graduates of six faculties of medicine abroad were represented. Table 6 records the number of diplomates from each school certified in 1939. At the College of Medical Evangelists, students are required to pass parts I and II as a prerequisite to receiving their diploma. The comprehensive qualifying examination, or part I of the examination of the National Board, has been required of all medical students entering Yale University School of Medicine since the fall of 1937. Students of Georgetown University School of Medicine are urged to take the examinations of the National Board. Students admitted to Boston University School of Medicine subsequent to 1937 are required to pass part I in order to supplement the qualifications for promotion to the third year class.

TABLE 7.—*Licenses Granted on the Basis of National Board Certificates, 1939*

Alabama	4	New Hampshire	11
Arizona	1	New Jersey	25
Arkansas	2	New Mexico	6
California	29	New York	210
Colorado	6	North Carolina	12
Connecticut	22	North Dakota	4
District of Columbia	27	Ohio	9
Georgia	7	Oklahoma	1
Illinois	11	Oregon	8
Indiana	2	Pennsylvania	20
Iowa	6	Rhode Island	14
Kansas	3	South Dakota	1
Kentucky	3	Tennessee	2
Maine	7	Utah	2
Maryland	18	Vermont	7
Massachusetts	101	Virginia	5
Michigan	13	Washington	14
Minnesota	9	West Virginia	4
Mississippi	1	Wyoming	2
Missouri	10	Hawaii	10
Montana	3		
Nebraska	3	Totals	667
Nevada	2		

TABLE 8.—*States Endorsing Certificates of National Board of Medical Examiners*

Alabama	Illinois	Montana	Pennsylvania
Alaska	Indiana	Nebraska	Puerto Rico
Arizona	Iowa	Nevada	Rhode Island
Arkansas	Kansas	New Hampshire	South Carolina
California	Kentucky	New Jersey	South Dakota
Canal Zone	Maine	New Mexico	Tennessee
Colorado	Maryland	New York	Utah
Connecticut	Massachusetts	North Carolina	Vermont
Delaware	Michigan	North Dakota	Virginia
Dist. of Columbia	Minnesota	Ohio	Washington
Georgia	Mississippi	Oklahoma	West Virginia
Hawaii	Missouri	Oregon	Wyoming

All students before entering the senior class at the New York Medical College must have taken part I of the examination of the National Board. While the certificate is not required by these schools, their graduates and, in addition, those of Harvard, Tufts and Duke universities, represented the majority of those certified.

Diplomates licensed on the basis of their credentials increased from two in 1917 to 667 in 1939, 5,460 having been so licensed since the National Board was formed. However, 7,437 have received the certificate of the board. In 1939 diplomates were registered on the basis of credentials in forty-one states, the District of Columbia and Hawaii. The number so registered will be found enumerated in table 7.

The certificate of the National Board of Medical Examiners is granted recognition by the licensing boards of forty-three states and the District of Columbia, Alaska, the Canal Zone, Hawaii and Puerto Rico (table 8). Some of these states have additional requirements.

Diplomates of the National Board of Medical Examiners are admitted to the final examination given by the Conjoint Examining Boards of England and Ireland and the Triple Qualification Board of Scotland. The certificate is accepted by the United States Public Health Service in lieu of the usual written examination. The certificate in the past has been recognized by Lebanon, South Africa, Spain, Syria and Turkey.

Examinations in parts I and II are held at class A medical schools where there are five or more candidates desiring to be examined, and part III is held in twenty-two established centers throughout the United States.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, APRIL 27, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

THE STATUS OF MEDICAL LICENSURE

Medical licensure statistics presented in this issue of The Journal reveal that, in 1939, 6,043 physicians were licensed (for the first time) to practice medicine. Here is no indication of a dearth of doctors. Quality, however, is more important than quantity and in this respect the situation is far from satisfactory. One hundred and ninety-five graduates of unapproved schools were admitted to practice in thirteen states (chart 1, page 1654), Massachusetts, Illinois, Ohio and New York heading the list. In these four states there were licensed, respectively, seventy-nine, fifty-one, thirty-six and twelve graduates of unapproved medical schools.

A still more serious degradation of the standards of medical practice results from the trend in recent years to abolish the restrictions which have heretofore governed the practice of osteopathy. In seven states medical licenses have been issued to 118 osteopaths who are not graduates of any medical school. New Jersey has issued forty-five such licenses and Texas thirty-six (chart 2, page 1656). Law making bodies seem to have forgotten that when osteopathy was seeking legal recognition its advocates stoutly maintained that it was a system of healing having nothing to do with medicine and that it would be most unjust to require practitioners of osteopathy to undergo the same training and meet the same educational requirements as doctors of medicine.

Medical journals and the public press have commented on the numbers of medical licenses issued to graduates of schools outside the United States and Canada. The facts are graphically presented in chart 3 (page 1658). Twenty-eight states and the District of Columbia licensed 925 graduates of foreign schools, New York heading the list with 497; New Jersey with eighty-five and Illinois with eighty placed second and third. Some of these 925 foreign graduates are citizens of the United States who studied abroad because they had failed to secure admission to medical schools in this country; the majority are Europeans who sought asylum in the United States.

POSSIBLE ROLE OF ASCORBIC ACID IN ANIMAL TISSUES

The availability of ample quantities of synthetic ascorbic acid has made possible extensive studies of the physical, chemical and physiologic properties of this vitamin.[1] Among the many properties of ascorbic acid, its reversible oxidation-reduction behavior has been extensively examined. The oxidation of ascorbic acid with the formation of dehydroascorbic acid and the reduction of the latter to the vitamin again has been studied in physical-chemical and physiologic systems. The data obtained have led to the suggestion that one of the chief functions of ascorbic acid in animal tissues is that of a reversible oxidation-reduction system, acting as a carrier in a respiratory system in which a substrate may be combusted and oxygen utilized.

The concept of ascorbic acid functioning in animal tissues as a reversible oxidation-reduction carrier appears to be supported by a variety of evidence. Physical-chemical measurements of the oxidation-reduction potential of the vitamin have made it evident that a number of naturally occurring tissue constituents could bring about the oxidation of ascorbic acid. Thus the cytochrome-indophenol oxidase system has been demonstrated to function as a catalyst for the aerobic oxidation of ascorbic acid, and there is evidence that this system is chiefly responsible for the slow aerobic oxidation of the vitamin in excised animal tissues.[2] The oxidized form of the vitamin might then undergo reduction by naturally occurring substances like gluta-

1. C. G. King (Physiol. Rev. **16**: 238 [April] 1936) presents a review of vitamin C, ascorbic acid.
2. Stotz, Elmer; Schultze, M. O.; Harrer, C. J., and King, C. G.: J. Biol. Chem. **122**: 407 (Jan.) 1938.

thione or by the fixed sulfhydryl groups of tissues. The existence of both ascorbic acid and dehydroascorbic acid in animal tissues contributes to the plausibility of hypotheses postulating important roles for vitamin C in oxidation reactions in animal tissues.

Notwithstanding the circumstantial evidence which can be martialed in support of the theory that ascorbic acid functions as a major respiratory carrier in animal tissues, experimental data have not been presented to confirm unequivocally the suggested respiratory roles. On the contrary, experiments designed to contribute information to this problem have yielded essentially negative results. Liver and kidney tissue obtained from scorbutic guinea pigs do not show a decreased respiration capacity despite their depletion in vitamin C. When ascorbate is added to the depleted tissues there is no rise in the true oxygen consumption.[3] More recently, King and his collaborators [4] at the University of Pittsburgh have failed to demonstrate any activity of ascorbic acid as a hydrogen transfer agent in an in vitro system containing nicotine hemochromogen, ascorbic acid, coenzyme, dextrose dehydrogenase and dextrose. In addition, it was shown that dehydroascorbic acid is not reduced by reduced cozymase. On the basis of this fact it is not likely that the vitamin has a role as a respiratory carrier in those dehydrogenase systems which depend on cozymase as a coenzyme. Support is not evident in this investigation or in the earlier experiments from the same laboratory [5] that ascorbic acid functions in animal tissues as a catalytically active, oxidation-reduction carrier. The results, although based essentially on systems constructed in vitro, should make definite experimental evidence to the contrary a prerequisite for the acceptance of functions for vitamin C other than that of curing scurvy. It may well be that the efficacy of the vitamin as an antiscorbutic agent is related to a specific role in either oxidation-reduction reactions or to reactions that are responsible to a considerable degree for the transfer of hydrogen or electrons in the oxidation of metabolites. In this connection might be mentioned the striking recent report [6] that experimental alcaptonuria, as manifested by a urinary excretion of homogentisic acid, may be produced in guinea pigs and in man by the administration of the amino acid tyrosine in a dietary regimen low or lacking in vitamin C. The disappearance of the homogentisic acid from the urine was effected by supplying the vitamin in moderate excess despite the continued administration of tyrosine. Here perhaps is an in vivo example of a relation of ascorbic acid to oxidation processes concerned with the complete metabolism of tyrosine. Despite this preliminary suggestion, conclusive evidence for the specific function of ascorbic acid in the oxidation of metabolites in vivo remains to be established. Until these data are available, the many suggested roles for vitamin C in the organism remain, in some instances, unsupported theories and, in others, working hypotheses.

3. Stotz, Elmer; Harrer, C. J.; Schultze, M. O., and King, C. G.: J. Biol. Chem. 120: 129 (Aug.) 1937.
4. Schultze, M. O.; Harrer, C. J., and King, C. G.: J. Biol. Chem. 121: 5 (Nov.) 1939.
5. Stotz, Schultze, Harrer and King.[3] Stotz, Harrer, Schultze and King.[3]
6. Sealock, R. R., and Silberstein, H. E.: Science 90: 517 (Dec.) 1939.

EARLY MEDICAL EDUCATION IN THE PACIFIC AREA

In his presidential address before the Pan-Pacific Surgical Congress in Honolulu, J. Hardie Neil [1] pointed out that most of those attending these congresses came from North America and Australasia. These physicians are mainly representative of the colonial stock, which grappled with difficulties that only those imbued with the spirit of the pioneer could overcome. Likewise in Australasia the early efforts of these pioneers to provide medical education have developed into great universities on the Pacific shore. Three personalities dominated the early history of medical education in California. Dr. Elias Cooper's work in vascular surgery was probably the first laboratory research made in the Pacific countries, and his successful cesarean section was the first recorded in those lands. When Cooper's medical school became moribund it was reorganized by his nephew, Cooper Lane, a surgeon whose work on craniotomy and hysterectomy was based on high attainments in anatomy and physiology. He brought the West into the forefront of the medical world by instituting lectures by Allbutt, Welch, MacEwen, Nicholas Senn, Reginald Fitz and other masters. His family richly endowed the medical college, which eventually was absorbed by Stanford University. Dr. Hugh Toland, a practitioner of both medicine and surgery, founded a medical school which after his death became the medical department of the University of California. Dr. J. P. Widney in 1885 organized the medical department of the University of Southern California and later was president of the university. Dr. Widney is still living in his ninety-seventh year.

Medical education in Australasia commenced in 1863, when a medical school in Melbourne University was established. George Halford, with his insistence on research, and Sir Harry Allen, with his gift of imparting knowledge, laid the foundation for the medical culture of Melbourne. Sydney University opened its medical school in 1883 under the leadership of Anderson Stewart, one of the great personalities in the profession in Australasia. Among others who helped lay a broad foundation on which Sydney Medical School was based were Sir Almroth Wright and Sir Alexander MacCormack. South Australia has a medical school granting degrees after a five year course. Its first lecturer in physiology was Sir Edward Stirling, who discovered and reconstructed the remains of a specimen of Diprotodon australis, the largest marsupial that ever existed. In 1936 Queensland instituted a full medical

1. Neil, J. H.: Early Medical Education in the Pacific, New Zealand M. J. 39: 7 (Feb.) 1940.

course at the University of Brisbane, in which great attention is being paid to social medicine.

The problem of medical education in the South Sea Islands is difficult. Since the natives were given to magic in their care of the sick, missionaries made the first efforts toward medical education. Fiji was first among these islands to institute efforts toward organized medicine. The administration of the Colonial Medical Service in the islands of the Western Pacific was in Fiji, and here Sir William MacGregor wrote the act which constituted a Magna Carta of native rights and privileges. The Rockefeller Foundation entered this field in 1917, where it studied the results of hookworm disease, carried on health surveys and sanitation and was largely instrumental in starting the Central Medical School, which takes native students from nine different island groups. The Rockefeller Foundation gave a half million dollars to Sydney University for a medical building. In 1876 New Zealand University began giving instructions in anatomy and physiology for students, who later went overseas to complete their medical course. Thus the Otago Medical School began. These improvements in the facilities for medical education in the Pacific attracted men for whom routine work is inconsistent with their ambition, and so philanthropy came to their aid with research institutions. The Pan-Pacific Surgical Congresses bring together in Honolulu these great medical personalities from the Pacific countries.

Current Comment

THE TAFT HOSPITAL CONSTRUCTION PLAN

On April 18 Senator Taft of Ohio submitted to the Senate a plan for aiding states to build and operate needed hospital facilities, offered as a substitute for the Wagner-George bill. The Taft amendment is printed in full elsewhere in this issue (page 1676). It would provide that the federal government contribute, for a period of five years and from annual appropriations of $10,000,000, from 40 to 90 per cent of the cost of construction and improvement of hospitals the plans for which shall have been approved by a National Hospital Advisory Council to be appointed by the Surgeon General of the Public Health Service with the approval of the Administrator of the Federal Security Agency. The amendment recognizes that operating costs may well be an important consideration by providing for federal contributions for maintenance during the five year period, such contributions to be at a rate, during the first year, of $300 a bed for general and tuberculosis hospitals and $150 a bed for mental hospitals. During each of the succeeding four years the federal contributions will be at a rate per bed which is 20 per cent less than the rate during the preceding year. Recognition is given in the amendment to the suggestions made by representatives of the American Medical Association at the hearing on the Wagner-George bill that the National Hospital Advisory Council be authorized to assume more important functions than that bill contemplated. Senator Taft proposes, in effect, that all important steps involved in his plan shall be taken only after approval by the council. Title to the hospital facilities to be constructed and maintained under the provisions of the amendment will lodge in the state or governmental subdivision, not in the federal government as proposed in the Wagner-George bill. Apparently it is contemplated not only that new hospitals may be built but that additions to existing hospitals may be constructed as well in case this procedure will best serve the needs of a given community. Thus Senator Taft has availed himself of most of the important suggestions made by representatives of the medical and hospital organizations at the hearings. At the time when his amendment was submitted the subcommittee was about to report on the Wagner-George bill to the Committee on Education and Labor. Presumably the subcommittee will now take Senator Taft's proposed plan also into consideration before making its report.

EDUCATIONAL QUALIFICATIONS OF HEALTH OFFICERS

The Committee on Professional Education of the American Public Health Association has recently published its recommendations concerning the educational qualifications of health officers.[1] In general, these involve the completion of a course leading to the degree of Doctor of Medicine in a recognized medical school, one year's internship in an approved hospital including a service in communicable diseases, a preliminary period of supervised field experience in a well organized department of health and a period sufficient to give acquaintance with public health activities in general and especially an opportunity for the candidate to determine his own liking and fitness for a career in public health. Finally there should be at least one full academic year devoted to the study of public health in a suitable university. These recommendations should have a definite value in educating the public to the necessity for having well trained men in charge of our public health activities. They should also tend to discourage the too frequent practice of appointing state and local health officers as a reward for political service or on account of some personal friendship. Perhaps the most important feature of this pronouncement by the American Public Health Association is the clear recognition of the necessity for medical as well as scientific training. The committee states "Because of the unmistakable trend upon the part of governmental bodies to insist upon the medical degree as a prerequisite to appointment as health officer, and because it is impossible to foresee whether the prospective health officer will be located in a health department where his duties are restricted to administrative functions, it is inadvisable to encourage the candidate for a public health degree to look forward to a career as health officer unless he is also the possessor of a medical degree, and for these reasons our recommendations contain no reference to the nonmedical health officer."

1. The Educational Qualifications of Health Officers, Am. J. Pub. Health 29:1342 (Dec.) 1939.

LABELING OF VITAMIN-CONTAINING ALCOHOLIC BEVERAGES

Under regulations relating to the labeling of alcoholic beverages heretofore promulgated by the Federal Alcohol Administration Division, United States Treasury Department, any irrelevant scientific or technical matter that tends to create a misleading impression or any representation of curative or therapeutic effect which likewise tends to create such an impression is prohibited on labels. On April 4 the administration issued an interpretative ruling [1] declaring that henceforth these regulations will be violated if the labeling of any distilled spirit, wine or malt beverage capable of and made for beverage use refers to vitamin content, whether such reference specifically alludes to curative or therapeutic effects to be derived from the use of the product or merely states the fact that the product contains one or more vitamins. Because of the widespread sale and use of medicinal and dietary remedies containing vitamins, the administration believes that references to vitamins on the labels of alcoholic beverages will lead a substantial number of consumers to believe that the drinking of such beverages will be of curative or therapeutic benefit owing to their vitamin content when the facts in all such cases that have thus far come to the administration's attention indicate that such expectation will not be fulfilled. Bona fide preparations for tonic and special dietary uses, sold as such and not as beverages, which are composed of a base of distilled spirits, wine or malt beverages to which vitamins and possibly tonic ingredients have been added, are not subject to the administration's labeling requirements if they are sold under labels which clearly indicate that they are intended for dietary or tonic rather than beverage use and if their composition conforms to all requirements of the Federal Food, Drug and Cosmetic Act of 1938 with respect to products so labeled.

1. Federal Register 5:1390 (April 11) 1940.

THE DIRECTORY OF MEDICAL SPECIALISTS

Just available is the new "Directory of Medical Specialists Certified by American Boards," [1] prepared under the editorship of Dr. Paul Titus with Dr. J. Stewart Rodman as an associate. The work includes the names, addresses and other biographic data concerning 14,000 specialists who have been certified. Separate sections are devoted to the special boards, providing lists of officers, principles of organization, preparation requirements for the examinations and similar material, also biographic listings of those who hold certificates with the following data regarding each man: the birth date, year and place of graduation in medicine, year of certification, office address, hospital and medical school positions, and medical society affiliations. Much of the material is, of course, codified or it would demand far more space than is available. The volume is completed with an alphabetical list of those holding certificates, including the office, city and state address of each person and the name of the special board which granted the certificate. It is planned to issue revised editions of this directory every two years. Obviously a directory of this type is exceedingly important during that period of transition between the time when the concept of examining boards and specialties was first developed and the time when practically every qualified specialist will be able to indicate that he has the certificate of one of the examining boards.

1. The Directory of Medical Specialists Certified by American Boards, published by Columbia University Press, New York. The price is $5 per copy.

SEX RATIOS IN FAMILIES WITH HEMOPHILIA

Reports appear of a disturbed sex ratio in families with hemophilia, but some investigators apparently disagree as to the nature of the disturbed ratio. Eley [1] has stated that transmitters of hemophilia usually have more daughters than sons. Birch [2] observed that the children of persons with hemophilia are predominantly female but that the children of transmitters are predominantly male, the ratio being about 1.7 males to every female. In an effort to shed more light on the question of sex ratios in families with hemophilia, Macklin [3] has made a careful reinvestigation of this problem. In hundreds of families of transmitters collected at random from the literature there are apparently more males than females in a ratio of 58.3 to 41.7. Macklin points out, however, that a mere comparison of the total number of males to the total number of females in this manner in an attempt to determine whether there is an excess of males or females in the families of transmitters does not give a true picture. Since most transmitters are recognized only because they have males in their families in whom the disease develops, a more critical analysis which allows for this phenomenon is required. Indeed, according to Macklin, when the data are analyzed and allowances are made for this fact by appropriate mathematical means, the excess is found to be not real but only apparent. She concludes that there is no greater tendency to the production of males in the families of transmitters than there is in the families of other women and that a transmitter is not more apt to have sons than daughters, or daughters than sons. With regard to the sex ratio of children of persons with hemophilia, Macklin's data, which covered 130 families and more than 500 children, show that there were more females than males in this particular group, the ratio being 54.3 per cent to 45.7 per cent. As this investigator infers, however, it is questionable whether one is justified in concluding from these figures that bleeders in general have more daughters than sons. The group of families studied is comparatively limited and a wider survey may yield different data. In any case the careful investigation of Macklin emphasizes once again the importance of allowing for all possible factors before drawing conclusions in statistical studies of this kind. In cases in which there is seemingly a large distortion of the sex ratio and therefore an apparent infringement of the law of sex determination, one should be particularly careful to consider all the factors which might possibly affect the data before reaching a decision.

1. Eley, R. C.: Internat. Clin. 3:202 (June) 1936.
2. Birch, Carroll L.: Hemophilia, J. A. M. A. 99:1566 (Nov. 5) 1932.
3. Macklin, Madge T.: Sex Ratios in Families with Hemophilia, Am. J. Dis. Child. 58:1215 (Dec.) 1939.

ORGANIZATION SECTION

SUGGESTED SCHOOL HEALTH POLICIES

FOREWORD

The following report on school health policies is submitted to school superintendents, health officers, school physicians and nurses, directors of health and physical education, practicing physicians and dentists, and others interested in school health programs as a preliminary report for study, criticism and discussion. During the process of its preparation, helpful suggestions have been received from many sources and a number of professional groups have used it for group discussions.

In all, eight different national groups or committees have had some contact with or are interested in "Suggested School Health Policies." These groups are listed alphabetically together with a brief statement of their action:

1. American Association for Health, Physical Education and Recreation (a department of the National Education Association). "Suggested School Health Policies" was submitted to the president of this organization in October 1939, and during March and April 1940 several district meetings used it for discussion. Its executive committee has approved publication for study and discussion but without specific approval of content.

2. American Academy of Pediatrics. The American Academy of Pediatrics distributed copies of the report to school health committees in many states, and its Committee on School Health has given it official approval.

3. American Medical Association. Four sections of the American Medical Association, namely the sections on (1) Laryngology, Otology and Rhinology, (2) Ophthalmology, (3) Pediatrics and (4) Preventive and Industrial Medicine and Public Health, officially approved the tentative reports submitted to them.

4. American Public Health Association. Three sections of this organization approved the preliminary report, namely the sections on (1) Maternal and Child Health, (2) Public Health Education and (3) Epidemiology. Each of these sections offered numerous helpful suggestions, which have been incorporated in the revised material. The Maternal and Child Health Section, formerly the Child Hygiene Section, was the first group to which the report was submitted. This section approved the report as submitted and referred it for consideration by other sections. The final report will be submitted for approval by the American Public Health Association.

5. American School Health Association. "Suggested School Health Policies" was fully discussed at the last annual meeting of this group, and the report approved by its School Health Policies Committee.

6. Educational Policies Commission. This group, representing the National Education Association and the American Association of School Administrators, has allotted time at its next meeting for consideration of this report. A copy has been sent to each member.

7. Joint Committee on Health Problems in Education of the National Education Association and American Medical Association. In 1935 the Joint Committee published a report entitled "A Preliminary Study of Group Opinions Relating to Certain School Health Policies." That publication stimulated further consideration of school health policies, which in turn led to the present "Suggested School Health Policies." The Joint Committee considered a preliminary report at its 1939 annual meeting and at its 1940 annual meeting voted approval for publication, study and discussion.

8. National Organization for Public Health Nursing (School Nursing Section). Approval, in principle, was given by this group as well as many constructive suggestions.

"Suggested School Health Policies" is an attempt to integrate the views of many professional groups regarding various phases of school health programs. It is hoped that they will be viewed critically and that constructive suggestions will be offered for their clarification, modification and improvement.

This is a preliminary report approved by some groups, approved subject to minor changes by others, and discussed by still other groups without specific action. It is hoped that all the groups will appoint school health policies committees and cooperate in the preparation of a final report which will again combine, as far as possible, the group opinions of all interested in and concerned with school health programs.

INTRODUCTION (Abstract)

This statement of school health policies is planned to delineate the responsibilities of schools and to relate the school health program to the health programs and activities of other groups. In other words, it is an attempt to outline those things which schools should and should not do in the field of health. It will have fulfilled its function if it promotes study of school health programs and encourages thoughtful planning of procedures by which schools may contribute to individual and community health.

There are many groups interested in child health, especially parents, teachers, physicians, dentists, nurses, health departments, welfare agencies, departments of education, civic clubs and parent-teacher associations.

Pupils of all ages have health interests and, as they grow older, assume increasing responsibility for their own health care.

It is not necessary to mention the interest of other groups to reach the conclusion that no one professional group nor one social group has a monopoly of interest and responsibility for children's health. Improved child health will result not from the activities of one group or one organization but from the harmonious working together of many groups. This is one reason for considering a definite statement of school health policies important.

SCHOOL RESPONSIBILITIES

The various activities of schools for promoting and protecting pupil health and for education regarding health may be grouped in many different ways. For purposes of discussion and simplification and in order to avoid confusing terminology, school health responsibilities will be grouped under eight headings. Attention is called to the divisions being made to simplify and aid discussion, because the committee does not imply that each division is of equal importance or an iron-bound independent unit. Rather than this we emphasize the interrelationship of each unit and the overlapping of each division with all others. For example, although there is a division "health instruction," opportunities for health education permeate all divisions of the school

health program and the report will call attention to health education possibilities in all contacts of physicians and nurses with pupils, parents and teachers.

The school health program should:

1. Provide a healthful environment.
2. Have a planned program for the care of accidents occurring at school and sudden sickness.
3. Have a planned program to assist the community program for the prevention and control of communicable disease.
4. Provide a planned, graded program of health instruction.
5. Encourage periodic health examinations, develop a plan whereby such examinations will be obtained, and keep a cumulative record of the conclusions and recommendations.
6. Give special attention to those in need of medical or dental care through a follow-up program which will, where necessary, guide pupils and parents to sources of medical and dental treatment.
7. Provide special education programs for handicapped pupils.
8. Provide supervision and in-service training for teachers.

1. A HEALTHFUL ENVIRONMENT (in full)

There can be no argument regarding school responsibility for a healthful environment. Pupils are required to attend school, and the authority to compel attendance implies the responsibility to provide an environment conducive to growth, learning and health.

SANITATION

The first consideration in providing the desired type of environment is school sanitation, which includes adequate and hygienic lighting, healthful and comfortable heating, proper ventilation, a continuous supply of towels and soap, adequate toilet and washing facilities, modern safety and fire-preventive provisions, ample play areas, a sufficient number of drinking fountains of approved design, seating which prevents fatigue and encourages good posture, and a school room and school building which are clean and attractive. Standards for school sanitary facilities are frequently found in building codes of state departments of education and sanitary regulations of state departments of health. They are also available in textbooks on sanitation and on school health.

The question of school sanitation is not limited to the provision of sanitary facilities but includes the instruction of pupils in the proper care and use of these facilities, the housekeeping procedures used in cleaning the building and the supervision of pupils to see that supplies or equipment are not misused.

It should be pointed out that whereas clean, attractive sanitary schools are a protection against disease, they also have esthetic value and help pupils to learn ideals of sanitation. The importance of sanitation from the health education point of view is too frequently overlooked by teachers as well as physicians, nurses and other health specialists. The survey and evaluation of school sanitary facilities by pupils, under teacher direction, is an excellent health education project. Likewise facilities which make healthful living easy, enjoyable and socially acceptable contribute to health education and enable pupils to learn by doing.

The school custodian, because of his responsibilities for housekeeping procedures and for heating and ventilating, plays an important role in protecting the health of those using school buildings. As the importance of this role receives greater recognition, increased care will be given to the selection and training of custodians. The development of training schools for janitors and the standardization of housekeeping procedures are commendable measures which help schools provide a healthful place for pupils and teachers.

It is the committee's belief that schools should plan for a detailed observation of the sanitary features of each school building at least once each year and that written reports of such observations should be filed with the principal as well as with the superintendent of schools. The report should list definite recommendations for improvements that are needed. The person making this inspection will vary according to who is available and who is most competent. It may be the school physician or school nurse, the health officer or sanitary inspector. In large cities the superintendent of buildings will probably have a part in the inspection. In rural schools the teacher or county school superintendent may be the only person available for this purpose. Wherever available, a person particularly informed in matters of health and sanitation should be used.

SOCIAL AND EMOTIONAL ENVIRONMENT

A healthful environment requires more than attention to sanitation; it demands consideration of the school program and of pupils' mental and social environment. Methods of teaching, methods of disciplining, types of examinations, methods of promotion, amount of home work, the curriculum pattern and opportunities for pupil expression are all factors which influence the physical and mental health of pupils.

The school program should be arranged to prevent undue fatigue; there should be plenty of opportunity for activity, and periods of comparatively little activity should be interspersed with those of considerable activity. The program should allow for recess, relaxation and play periods, the frequency and length of which will be governed by changing needs of pupils as they progress from one school level to another. Excessive demands on pupils' strength and energy for either curricular or extracurricular activities are to be avoided.

In considering the arrangement of the school program in relation to health, particular attention should be given to the provision of adequate time for lunch, especially in those schools which require or permit pupils to eat at school. The lunch period should be long enough to permit the leisurely eating of food and the normal social intercourse which is a natural accompaniment of eating. The lunch room should be ample in size to avoid crowding; it should be clean, quiet, light and attractive in decoration. A hurried, strained, tense lunch period in a dark, crowded, noisy, unattractive room is as undesirable for teachers as it is for pupils. In addition to providing adequate time and suitable facilities, schools should consider the lunch period a laboratory in which pupils apply the knowledge of foods learned in the classroom. Observation of pupil lunches will tell whether health instruction in this field has been practical, adequate and successful or merely a learning of words and concepts not associated with actual living.

The mental health of pupils requires that teaching methods give ample opportunity for experiencing success, that disciplinary measures consider pupil personality of greater importance than the rigid application of arbitrary rules and that types of examinations and methods of promotion do not discourage or degrade but stimulate each pupil to do the best he can. Perhaps the most important mental hygiene factor in the school environment is the personality of the teacher. The nagging, scolding, domineering or emotionally unstable individual can seriously injure pupils; the teacher who is kind but firm, sympathetic but exacting, and friendly but reserved exerts a beneficial influence on pupils' mental health.

A healthful environment requires attention to sanitation, to the arrangement of the school program, to the mental hygiene of the classroom and also to the physical health of teachers, custodians, matrons and secretaries. The health of children is not safeguarded when we exclude pupils who are sick but allow a sick teacher, custodian or secretary to remain in school. These people all have more or less close contact with pupils and may cause the spread of communicable disease. For this reason, and because successful teaching is based on teachers' continued good health and because of the value of the example of healthy teachers, a number of schools now require a health examination, including such tests as the tuberculin test and x-ray, of all school employees previous to their employment and periodically thereafter. Such a program constitutes sound school policy and it is recommended that school authorities develop suitable ways for carrying out this policy. It is also recommended that principals assume responsibility for sending from school a teacher or other employee whose health condition may be detrimental to pupils or fellow employees.

Boards of education have responsibilities for the health of teachers, custodians and school secretaries in addition to those mentioned. Teaching and working places must be sanitary and safe. Provision for sick leave is needed. Peace of mind is encouraged by provisions for tenure and retirement. Suitable

rest rooms are needed in school buildings, and teaching and working loads must be reasonable. Boards of education must treat and judge employees and applicants on the basis of ability, with no favoritism or prejudice because of color, creed, friendship or race. By acting with other motives, a board of education may disturb the morale of its entire school staff and seriously interfere with the education of children.

2. CARE OF ACCIDENTS AND SUDDEN SICKNESS (in full)

Wherever large numbers of children are gathered, there are bound to be accidents. In particular, falls, cuts, bruises and sprains occur fairly frequently during the school day. It is expected that schools will do all that is possible to prevent such accidents through safety instruction, through elimination of dangerous or imperfect equipment, through alert supervision and through other safety procedures. It is realized, however, that some accidents will occur despite all precautions.

Again, pupils may become suddenly sick while at school. This sickness may be the onset of a communicable disease—the procedures for which will be discussed later—or it may be an attack of appendicitis, beginning pneumonia, acute indigestion, a toothache, an earache or any other sickness.

SCHOOL RESPONSIBILITIES

What should the schools do in the case of accident or sudden sickness? The committee believes that every school should have a planned, written program for the care of emergencies acknowledging school responsibility for (1) giving immediate care, (2) notifying parents, (3) getting pupils home and (4) guiding parents, where necessary, to sources of further treatment.

It is believed that the school should assume responsibility for the immediate care of those accidents which occur during school sponsored and school supervised activities wherever these activities take place. The school cannot and should not assume responsibility for the care of accidents occurring at home or during non-school sponsored programs.

IMMEDIATE CARE

Immediate care will frequently have to be administered by a teacher because no nurse or physician may be present when an accident occurs or when a pupil becomes sick. For this reason, schools should see that there is always some person at the school who is trained and informed concerning what should and what should not be done in those circumstances. When a nurse is at a school, she will naturally be expected to see that the school's responsibilities are met. In case of serious accident the school may call the school physician (or any other physician easily and quickly obtainable), but the services of the physician so summoned should be limited to necessary immediate emergency treatment. It will be found helpful for each school to have posted in the principal's office, or other convenient location, a list of names, addresses and telephone numbers of physicians in the neighborhood who may be called for emergencies. It is expected, of course, that each school will have first aid supplies available and accessible to all who may give emergency care.

What constitutes immediate emergency care? This, of course, varies with the type of sickness or accident. It may involve the control of hemorrhage in case of cuts, or the covering of a burn with a clean sterile dressing. On the other hand, it may require only the removal of a pupil from the classroom and permission for him to go home. Detailed instructions concerning the emergency care of various conditions, such as headache, cuts, bruises, dog-bites, suspected fractures, painful menstruation or pain in the abdomen, should be prepared by school physicians and copies distributed to each teacher. In general, it may be stated that ordinary first aid measures should be carried out in case of accidents but that the emergency treatment of sickness usually does not require that school personnel administer medication. The prescribing of acetylsalicylic acid for headache or pain, or the giving of sodium bicarbonate, epsom salt or essence of peppermint is unsound school policy and unsound health education. Most cases of early sickness will be best helped if the pupil is sent home and medication delayed until the physician makes a diagnosis and determines whether drugs are necessary. By following such a policy, schools will avoid the embarrassment caused by a pupil afflicted with a ruptured appendix because the parents postponed having a physician until they saw what effect the medicine given at school would have, and the equally embarrassing situation of giving acetylsalicylic acid for what turns out to be meningitis or brain tumor. In addition to avoiding embarrassment, the school will be doing good health education because it will be teaching that drugs are not taken for every condition which develops but usually only on the recommendation of one who understands their value, their limitations and their dangers.

NOTIFY PARENTS

As soon as possible after an accident or the onset of sickness the school should notify parents, turn over to them the decision as to where further treatment, if necessary, is to be obtained and arrange for the method and means of getting the pupil home. Sometimes this contact can be made by telephone; in other cases the contact will come when some one from the school accompanies the pupil home. No set procedure can be outlined which will cover all cases because of the differences in the economic status of parents, in the nature of the accident or sickness, in the personnel available and in the community resources for medical care. It does seem fitting, however, to warn of the danger of sending a sick or injured pupil home by himself or accompanied only by another pupil. The hazards of traffic and the possibility of no one being at home, of the sickness or injury becoming acutely worse on the way home and of the sickness being communicable are reasons for suggesting that an adult accompany pupils going home because of serious sickness or injury.

When a parent cannot be reached, it may be advantageous to get in touch with the private physician or private dentist of the injured pupil, explain the conditions and ask whether he chooses to provide whatever medical care is needed until such time as the parents can be reached. As an aid in doing this, it is suggested that the name and address of each pupil's private physician and private dentist be recorded on his permanent health record card. These data will, of course, require frequent revision. This procedure will have educative value to parents and pupils as well as be an aid in case of accidents and sudden sickness.

Occasionally there will be need for securing immediate hospital care for a pupil whose parents cannot be located, as for example when a pupil has a suspected skull fracture or suspected ruptured appendix. Naturally every possible effort should be made to reach the parents, but delay in securing medical attention may have serious consequences. There is need to plan for such eventualities. Where there is a city hospital, the use of this institution may be the solution. Likewise the use of city ambulances may be arranged.

In most instances school responsibility for pupils will end when they have been placed in the hands of parents. There are, however, cases in which parents will be unable to afford a private physician or not know where needed medical care can be obtained. The teacher or school health staff should guide these parents to treatment facilities available in the community for care of the needy.

ACCIDENTS IN ATHLETICS

Because of the prominence sometimes given the question of pupils injured in athletics, the committee expresses the opinion that the policies for the care of accidents as outlined in the preceding paragraphs are just as applicable to injuries in interscholastic and intramural athletics as to injuries occurring during other parts of the school program. Physical education teachers should be well trained in first aid procedures and fully informed regarding school policies for the care of those injured.

ACCIDENTS AND EDUCATION

In every accident and case of sudden sickness there are opportunities for health education. At such times the interest of pupils is aroused and they are anxious to know what should and should not be done. Older pupils should care for minor injuries under the supervision of teacher or nurse and the

educational value of such experience may equal the protective value of the first aid. Previously, in discussing cases of sickness at school, it was mentioned that pupils should be taught that medication is usually taken only on the recommendation of some person qualified to diagnose abnormal physical conditions and authorized to prescribe treatment. In both accident and sickness there are opportunities to help pupils develop judgment as to when medical aid should be sought as well as the limitations of care given by those without medical training. By utilizing opportunities for incidental health education present in unusual situations surrounding emergencies, teachers can impart knowledge and develop attitudes which will have far reaching effects.

3. PREVENTION AND CONTROL OF COMMUNICABLE DISEASE (in full)

In all communities, including those in which school physicians and nurses are employed by departments of education, there are certain communicable diseases which are reportable to departments of health and for the control of which the department of health is legally responsible. It is the department of health which formulates and enforces regulations regarding quarantine, isolation and other control measures. Representatives of this department visit each case of reportable communicable disease and give instruction regarding care of the patient and information regarding restrictions on other members of the family. Likewise it is the department of health which lists the duration of exclusion for pupils with various types of communicable disease as well as known contacts.

In certain rural areas, and other areas in which departments of health are not well organized, the teacher and other school personnel are in strategic positions to help prevent the spread of communicable disease. And even where departments of health are well staffed and well organized there are communicable conditions which may not be reportable, such as impetigo, conjunctivitis and pediculosis, the spread of which in schools can best be controlled through the efforts of school personnel. For these reasons, and because of the help schools can give departments of health in preventing and controlling reportable diseases, it is recommended that schools be responsible for the following four procedures:

1. Notify the department of health of suspected cases of reportable communicable disease.
2. Isolate and then send home as soon as possible pupils who seem sick.
3. Encourage parents to keep sick children at home and away from other children.
4. Stimulate parents' interest in smallpox vaccination and diphtheria immunization.

NOTIFY DEPARTMENT OF HEALTH

The department of health can do nothing about reportable diseases until informed of existing cases. Physicians are required to inform the department of health of all reportable diseases they diagnose, but in addition to this it is helpful for schools to give information regarding suspected cases of reportable disease. Usually the school personnel will make no definite diagnosis of disease but will report suspicious cases as having "a rash" or "rash and sore throat" or some similar statement of signs or symptoms. The detail arrangements for notifying departments of health should be worked out locally, but some plan is necessary if efficient preventive and control measures are to be carried out. In a similar manner, departments of health should keep schools informed of the prevalence and distribution of cases of communicable disease.

SEPARATION OF PUPILS

When a pupil in school is suspected of having communicable disease such as measles, scarlet fever or chickenpox, he should be separated immediately from other pupils and arrangements made for sending him home. In addition to sending him home, it may be desirable to have the desk and other fixtures which he has touched washed with soap and water.

It is believed that pupils with beginning colds should be sent home for their own good and for the protection of other pupils. Many communicable diseases start like a cold, and by excluding pupils with the earliest manifestations of a cold we may exclude some who are developing more serious conditions. Also most colds are communicable and pupils should be protected against exposure to them. A pupil with a beginning cold should have rest in bed and other care obtainable only at home. For these reasons, schools should encourage pupils to stay at home when they have a beginning cold and exclude for at least two days those who have definite, recognizable signs of a beginning cold, as well as those with severe colds or coughs. This suggestion recognizes the impracticability of excluding all pupils with colds while emphasizing the importance of beginning colds and severe colds.

DAILY INSPECTION

As a means of detecting pupils who should not be permitted to stay in school, the morning inspection by classroom teachers has become a recognized and approved procedure for elementary schools. Schools should adopt some form of daily morning inspection and should prepare written instructions for the guidance of teachers. These written instructions should outline various methods of making inspections, list signs and symptoms which warrant exclusion and give procedures to be followed in sending pupils home. They should warn against suggesting a specific diagnosis, caution the teacher against touching pupils during the inspection and emphasize the avoidance of comments which cast reflections on the character or motives of pupils or their parents.

When a pupil is allowed to go home or is sent home because of sickness, parents should be fully informed of the reason and where necessary the teacher or some member of the school health staff should supply information as to where needed treatment is available.

FALSE EMPHASIS ON PERFECT ATTENDANCE

Two procedures occasionally found in schools are iniquitous in their effect on measures to control communicable disease. One is the commendation of pupils with perfect or near perfect attendance with certificates, awards or similar devices. This procedure leads parents to believe that teachers want pupils in school at all times regardless of the pupils' condition. The other bad practice is the allotment of state funds to schools on the basis of the average number of pupils in daily attendance. Whereas attendance awards to pupils make parents anxious to have pupils always in school, the allotment of funds on the basis of average daily attendance makes teachers anxious to force attendance under all conditions. Both practices are condemned as based on the false premise that children are always in condition to attend school. Instead of demanding perfect attendance regardless of pupils' health, schools should urge parents to keep pupils home and in bed if there is any evidence of disease. In addition, commendation should be given to those pupils who protect the health of their classmates by remaining at home when not well.

COOPERATION WITH PARENTS

Many schools notify parents of the occurrence of communicable disease in the classroom of their children. This notification usually includes suggestions as to how parents may recognize the beginning signs of disease, urges that parents keep at home children who show any of these signs, and outlines preventive measures which are available. It also outlines the procedures which the school is using to prevent the spread of disease. Letters of this type are quite helpful. They gain the cooperation of parents—without which communicable disease control cannot be fully effective—and they allay apprehension. They usually result in better health supervision of pupils by their parents.

SMALLPOX AND DIPHTHERIA

School epidemics of smallpox and diphtheria are uncommon nowadays, owing partly to efforts of departments of health and education in teaching their preventability and providing facilities so that treatment is available to all.

It should be the policy of all schools to teach pupils the history of smallpox vaccination and diphtheria immunization and to show the results which have followed their application. In addition to teaching these things, schools should see that mothers of children entering school are fully aware of the necessity for children being protected against these diseases and know sources of treatment.

In each community there should be treatment facilities available for children of all economic levels. In most cases the school personnel will refer parents to their private physician for vaccination and for diphtheria immunization. Where parents cannot afford to pay for the services of a private physician, school personnel will refer children to hospital outpatient clinics, dispensaries, department of health clinics or other facilities which the community provides. As a general rule it is believed undesirable to conduct clinics in schools, although this may be the only way some communities will be able to solve the problem of making treatment available to all.

In their efforts to encourage diphtheria immunization, schools should emphasize this treatment as most needed and effective when children are approximately 1 year old. Conversely, they should avoid creating the impression that diphtheria immunization is not necessary until a child enters school.

Recently the attention of physicians has been directed to suggested preventive treatments for whooping cough and scarlet fever. Because of differences of opinion as to the efficacy of these preventive measures as well as varying views of the advisability of their general application, it is recommended that school personnel do not as yet advocate their use. Patients who ask about the desirability of these measures should be instructed to discuss the matter with their private physicians.

TUBERCULOSIS

At the high school level the most important communicable disease is tuberculosis, which, despite the marked decrease that has occurred during the past few decades, is still the leading cause of death for those between 15 and 25 years of age. School health programs can materially aid in the campaign to eradicate this disease. They can see that high school pupils are given information regarding its cause, the way it spreads and the achievements of Koch, Roentgen and Trudeau, and an understanding of local community activities which are directed toward the control and prevention of the "white plague." In the health service program a case-finding plan utilizing the best known diagnostic measures—such as the Mantoux test, x-rays and fluoroscope—should be developed with the assistance of tuberculosis experts. This case-finding plan and the follow-up of conditions found should be integrated with other community tuberculosis activities and supplement both programs for the care of those with active tuberculosis and case-finding programs among contacts.

CLOSING OF SCHOOLS

Should schools be closed when epidemics occur? This is a perennial question and one about which there have been different opinions and changing views. Whereas a generation ago the usual recommendation was to close the schools, in recent years the consensus of public health officials has been that epidemics in cities can be controlled best if schools remain open. It has been found that when city schools are closed many children play together unsupervised, go to movies together and in other ways have numerous opportunities for contact and for the spread of disease. At the same time lack of supervision results in the occurrence of cases which are not reported to the department of health. On the other hand, if schools are kept open and regular inspections conducted, they can be made a safe place for well children while the sick ones are excluded and supervised by the staff responsible for communicable disease control.

There is a difference between closing schools and delaying the opening of schools. Ordinarily little is accomplished by closing schools after pupils have been exposed to infection; but in the presence of an epidemic at the time schools open in the fall and perhaps after other vacations a delayed opening may avoid bringing together a large unexposed group.

It is believed that a decision regarding the closing of schools when epidemics occur or threaten should be decided locally by answering the following two questions:

1. Are nursing and medical staffs so adequate and the teaching staff so alert that the inspection and supervision of pupils will keep sick pupils out of school?

2. If schools are closed will pupils be kept at home and away from other pupils or will the closing of schools increase opportunities for contact with possible sources of infection?

It is quite possible that these questions will be answered differently in different communities. As a general policy it is suggested that provision be made so that question 1 can be answered affirmatively, in which case schools will be kept open in the face of an epidemic in most large public schools and in thickly settled communities. In smaller communities with scattered homes and chances for personal contact limited, it may be found desirable to close schools. Also in rural communities where pupils are transported in busses, and close contact is unavoidable, it may be desirable to close schools.

(To be continued)

THE TAFT HOSPITAL CONSTRUCTION PLAN

76TH CONGRESS
3D SESSION

S. 3230

IN THE SENATE OF THE UNITED STATES
APRIL 18 (legislative day, April 8), 1940
Ordered to lie on the table and to be printed

AMENDMENT

(IN THE NATURE OF A SUBSTITUTE)

Intended to be proposed by Mr. TAFT to the bill (S. 3230) to promote the national health and welfare through appropriation of funds for the construction of hospitals, viz: Strike out all after the enacting clause and in lieu thereof insert the following:

That the Social Security Act, as amended, is hereby amended by adding at the end thereof the following new title:

"TITLE XII—GRANTS TO STATES FOR HOSPITALS

"SEC. 1201. For the purpose of enabling each State, as far as practicable under the conditions in such State, especially in rural areas and in areas suffering from severe economic distress, to construct and improve hospitals and assist its governmental subdivisions to construct and improve hospitals, and to assist the States for a period of five years in defraying the operating cost of added facilities, and to provide training and instruction of personnel which will be required in connection with the hospitals, there is hereby authorized to be appropriated with respect to general, mental, and tuberculosis hospitals, for the fiscal year ending June 30, 1941, and for each of the four succeeding fiscal years, the sum of $10,000,000. The sums authorized under this section shall be used for making payments to States which have submitted, and had approved by the Surgeon General of the Public Health Service, State plans for constructing and improving needed hospitals.

"SEC. 1202. (a) A State plan to effectuate the purposes of this title, shall—

"(1) provide for financial participation by the State or by governmental subdivision in which the hospital is located or by both;

"(2) provide for the administration of the plan by the State health agency or for the supervision by the State health agency of any part of the plan administered by another State agency or by a governmental subdivision of the State;

"(3) provide such methods of administration as are found by the Surgeon General of the Public Health Service to be necessary for the proper and efficient operation of the plan, including methods relating to the establishment and maintenance of personnel standards on a merit basis, and methods of establishing and maintaining standards for institutional management and remuneration for such management, such methods to be prescribed by the State agency after consultation with such professional advisory committees as the State agency may establish;

"(4) provide that ownership of real estate, improvements, and equipment acquired in connection with the construction or

improvement of any hospital be vested in the State or in one or more of its political subdivisions;

"(5) provide a system of financial support which will give reasonable assurance of the continued maintenance of such hospitals and of their availability to all persons in the designated area, subject only to the suitability of the hospitals for the particular diseases and conditions of such persons and to the financial arrangement for payment for services rendered to such persons;

"(6) provide for an advisory council or councils, composed of members of the professions and agencies, public and private, that furnish services under the State plan, and other persons having knowledge of the need for hospitals; and

"(7) provide that the wages paid or to be paid to laborers and mechanics employed in the construction of such hospitals are not less than the wages prevailing in the locality for work of a similar nature, as determined or adopted (subsequent to a determination under applicable State or local law) by the Commissioner of Labor Statistics.

"(b) The Surgeon General of the Public Health Service shall approve any plan which fulfils the conditions specified in subsection (a).

"SEC. 1203. There is hereby established the National Advisory Hospital Council (hereafter referred to as the Council) to consist of the Surgeon General, as Chairman, and eight members to be appointed by the Surgeon General with the approval of the Federal Security Administrator. The eight appointed members shall be selected from leading medical and scientific authorities who are outstanding in matters pertaining to hospitals and other public services. Each appointed member shall hold office for a term of four years, except that (1) any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term, and (2) the terms of office of the members first taking office shall expire, as designated by the Surgeon General at the time of appointment, two at the end of the first year, two at the end of the second year, two at the end of the third year, and two at the end of the fourth year after the date of the first meeting of the Council. Each appointed member shall receive compensation at the rate of $25 per day during the time spent in attending meetings of the Council and for the time devoted to official business of the Council, under this Act, and actual and necessary traveling and subsistence expenses while away from his place of residence upon official business, under this Act.

"SEC. 1204. The Council is authorized to advise the Surgeon General with reference to the carrying out of the provisions of this Act, including (1) the formulation of standards which are necessary to insure the construction of proper buildings and the securing of proper equipment; (2) the method by which personnel may be best trained and instructed; (3) the standards and principles to be considered in approving any State plan.

"SEC. 1205. Any State, or any governmental subdivision within any State, which has submitted and had approved by the Surgeon General a plan in accordance with section 1202 may file application with the Surgeon General for the construction of a general, mental, or tuberculosis hospital. Such application shall contain a description of the site and plans and specifications for such hospital and such other information as may be required by the Surgeon General. Each application shall be submitted to the National Advisory Hospital Council and considered by such Council, which shall approve or reject the same and shall have power to indicate the priority in which approved projects shall receive funds. The Council shall, furthermore, fix the percentage of the cost of said project which shall be paid by the Federal Government, which cost shall in no case be less than 40 per centum or more than 90 per centum of the cost of construction of said hospital and the purchase of equipment therefor, exclusive of the cost of the site. In determining the amount of Federal assistance, the Council shall take into consideration the financial resources of the State making the application, as measured by the per capita income accruing to the inhabitants thereof. The Council shall further determine whether any allotment shall be made for the training and instruction of personnel in connection with such hospital and whether any allotment shall be made to defray the operating cost of added facilities and shall fix the amount to be allowed for such training and instruction of personnel, which shall in no case exceed 5 per centum of the total allotment; and shall fix the amount to be paid for defraying the operating cost of added facilities. Such amount shall be at a rate of $300 per added bed for general hospitals and for tuberculosis hospitals, and $150 per added bed for mental hospitals, during the first year of operation, and during each of the succeeding four years of operation the amounts made available for defraying such operating cost shall be paid at a rate per added bed which is 20 per centum less than the rate per added bed applicable during the preceding year.

"SEC. 1206. The Surgeon General is authorized after receiving the recommendations of the Council (a) to conduct, assist, and foster studies and surveys with respect to needs for hospitalization and problems of hospitalization operation; (b) to approve hospital projects and to allocate available funds to States and governmental subdivisions for such approved projects; (c) to fix the amount and allocate available funds to States and governmental subdivisions for training and instruction of personnel which will be required in connection with an approved hospital; (d) to fix the amount to be paid any State for defraying the operating cost of added facilities during the next five years, and allot available funds therefor; (e) to cooperate with Federal, State, and local health and welfare authorities and with professional agencies; (f) to make inspections with respect to professional service and standards of maintenance of the hospitals constructed under this Act; (g) to adopt such additional means as may be found necessary or appropriate to carry out the provisions of this Act.

"SEC. 1207. From the sums appropriated therefor under the authority contained in section 1201, and the allotments made in accordance with section 1206, payments shall be made to each State which has a plan approved under section 1202 for such amounts as may be fixed by the Surgeon General on the recommendation of the Council. The Surgeon General shall from time to time, but not less than semiannually, determine the amounts to be paid to each State or governmental subdivision to which Federal funds have been allotted, and shall certify such amounts to the Secretary of the Treasury. Upon receipt of each such certification for payment, the Secretary of the Treasury, through the Division of Disbursements, shall pay to the State the amount so certified.

"SEC. 1208. Whenever the Surgeon General of the Public Health Service finds, after reasonable notice and opportunity for hearing to the State agency administering or supervising the administration of any State plan approved under this title, that in the effectuation of administration of such plan there is failure to comply substantially with any requirement of section 1202 (a), he shall notify such State agency that further payments will not be made to the State until he is satisfied that there is no longer any such failure to comply. Until he is so satisfied he shall make no further certification to the Secretary of the Treasury with respect to such State.

"SEC. 1209. There is hereby authorized to be appropriated for the fiscal year ending June 30, 1941, and for each of the four following fiscal years, the sum of $500,000 for all necessary expenses of the Public Health Service in administering the provisions of this title, including the printing of forms and reports, the making of such studies as will expand and improve the quality of hospital facilities and promote the efficient administration of this title, and for the pay, allowances, and travel expenses of commissioned officers (Regular and Reserve), and other personnel of the Public Health Service assigned to duty in carrying out the purposes of this title in the District of Columbia and elsewhere.

"SEC. 1210. When used in this title, (a) the term 'hospital' includes health, diagnostic, and treatment centers, the equipment thereof, and facilities relating thereto; (b) the term 'State' includes the several States, Alaska, Hawaii, Puerto Rico, and the District of Columbia."

Amend the title so as to read: "A bill providing for grants to States and governmental subdivisions thereof for hospitals and health centers."

MEDICAL LEGISLATION

STATE MEDICAL LEGISLATION

Mississippi

Bills Introduced.—H. 800 proposes to appropriate $650,000 to be disbursed to approved hospitals caring for the indigent sick in counties in which no state supported charity hospital is operated. The bill proposes also to appropriate $75,500 to each of the following state charity hospitals: South Mississippi, Matty Hersee, Jackson, Vicksburg and Natchez. H. 973 proposes to appropriate $50,000 "for expenditure under the supervision of the state board of vocational rehabilitation of disabled persons, and in the treatment of crippled individuals whose restoration may be brought about by said expenditures." The bill also proposes to appropriate an additional $50,000 "for expenditure under the supervision of the state board of vocational rehabilitation for crippled children's work." H. 1025 proposes that all hospitals qualifying under the provisions of chapter 178, Laws, 1936, shall before being entitled to any money appropriated by the legislature maintain at all times at least two beds for white and two beds for colored maternity cases. The bill also proposes to require all charity hospitals under the supervision of the hospital commission to maintain at all times at least five beds for white and five beds for colored maternity cases.

MEDICAL BILLS IN CONGRESS

Change in Status.—H. R. 9236 has been reported to the House, proposing an additional appropriation of $75,000 for the preparation of "talking books" for the blind.

Bills Introduced.—Senator Taft, of Ohio, has proposed an amendment to the Wagner-George hospital construction bill, S. 3230, which strikes out all after the enacting clause and inserts new phraseology under which the federal government would, from annual appropriations of $10,000,000 for five years, contribute from 40 to 90 per cent of the cost of constructing hospitals to be built under plans to be approved by the National Advisory Hospital Council. Federal aid too would be given for a period of five years in defraying operating costs. Title to hospital facilities constructed under the Taft plan would lodge in the state or political subdivision. A copy of the Taft amendment is printed elsewhere in this issue. Senator Pepper, Florida, has proposed an amendment to the bill making appropriations for the Department of Labor, the Federal Security Agency and related independent agencies. H. R. 9007, under which it is contemplated that $100,000 shall be made available to the United States Public Health Service for researches, investigations and studies relating to the cause, diagnosis and control of pneumonia, influenza and the common cold. H. R. 9362, introduced by Representative Angell, Oregon, proposes a federal appropriation of $2,500,000 to construct at Portland, Ore., a hospital for the care and treatment of the insane of the territory of Alaska and of such other classes of persons who are insane or who may require mental treatment as the President may designate for care and treatment in such hospital. H. R. 9425, introduced by Representative May, Kentucky, proposes an appropriation not to exceed $900,000 for the construction of barracks at the Army Medical Center, District of Columbia.

DISTRICT OF COLUMBIA

Changes in Status.—H. R. 7865 has been reported to the House with amendment, proposing to regulate the practice of dentistry in the District of Columbia. H. R. 8692 has been reported to the House with amendments, proposing to regulate the practice of podiatry in the District of Columbia. As amended, the bill proposes to define podiatry as the "surgical, medical, or mechanical treatment of any ailment of the human foot, except the amputation of the foot or any of the toes; and, also, except the use of an anesthetic other than a local one." H. R. 9284 has been reported to the House, directing the Commission on Licensure to Practice the Healing Art in the District of Columbia to issue a license to practice the healing art to Dr. A. L. Ridings.

WOMAN'S AUXILIARY

Arizona

Mrs. Rollo K. Packard, president, Woman's Auxiliary to the American Medical Association, was the guest speaker before the auxiliary to the Arizona State Medical Society in Phoenix, December 15.

Colorado

Mrs. Lorenz W. Frank, president of the auxiliary to the Colorado State Medical Society, and five other members of the society's board of directors were guests of the auxiliary to the Arapahoe County Medical Society at its meeting in Englewood, January 29.

Florida

The auxiliary to the Polk County Medical Society met in Bartow, December 13. Mrs. L. C. Ingram, president of the auxiliary to the Florida Medical Association, asked the auxiliary to bring to the attention of the public the radio programs of the American Medical Association.

Georgia

Mr. L. W. Murphy, sanitary engineer in the department of typhus control, state board of health, spoke at a public health relations meeting sponsored by the Ware County Medical Society and its woman's auxiliary in Waycross, November 7. Mr. Murphy showed a film entitled "No Good on Earth," showing the damage that is done by rats. Dr. G. E. Atwood, Ware County commissioner of health, was a speaker. Pamphlets on typhus fever were distributed.

The auxiliary to the Baldwin County Medical Society met in Milledgeville recently. Dr. J. H. Litton, county health physician, spoke on health education.

The auxiliary to the Fulton County Medical Society met in November in Atlanta. Dr. Felix B. Welton, who spent seven years in China, spoke on "The Practice of Medicine in China." The auxiliary sponsored a book review of "Inside Europe," by John Gunther, given by Mrs. Robert Church Jr. at the Academy of Medicine in Atlanta, recently.

Texas

The auxiliary to the El Paso County Medical Society met in El Paso, November 11. Dr. I. M. Epstein spoke on "The Child Guidance Clinic."

The auxiliary to the Tarrant County Medical Society was entertained by the auxiliary to the Fort Worth Dental Society, on December 7. December 8, they were guests of Dr. and Mrs. Truman C. Terrell at All Saints Episcopal Hospital in Fort Worth. Following a luncheon, a program was presented on "Great Personalities in Medicine." Mrs. E. L. Howard reviewed the book "A Woman Surgeon," by Rosalie Slaughter Morton.

Virginia

The auxiliary to the Norfolk County Medical Society entertained the wives of the physicians who attended the Seaboard Medical Association in Virginia Beach, December 13-14. The auxiliary held its annual card party, January 24, at the Town Club in Norfolk to raise money to maintain a patient in the Tidewater Memorial Hospital and to assist the Diagnostic Tumor Control Clinic.

The auxiliary to the Petersburg Medical Society held its November meeting in the home of Mrs. Meade Edmunds in Petersburg. The auxiliary will contribute funds to the hospitals for the purchase of linens and other supplies.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ADDITIONAL MEDICAL COLLEGE NEWS AND ARTICLES APPEAR IN THE STUDENT SECTION, PAGE 1705.

ARKANSAS

Dr. Henry Resigns as Professor.—Dr. Charles R. Henry has resigned as full time professor of obstetrics and gynecology at the University of Arkansas School of Medicine, Little Rock, according to the state medical journal. He will continue on a part time basis with the department.

University News.—Dr. Duff S. Allen, assistant professor of clinical surgery, Washington University School of Medicine, St. Louis, delivered the third annual lecture of the University of Arkansas School of Medicine, Little Rock, sponsored by the local chapter of Phi Beta Pi medical fraternity, April 12, on "The Effect of Toxic Goiter on the Heart."

CALIFORNIA

University News.—The John and Mary R. Markle Foundation, New York, recently gave a grant of $2,430 for research into the bacteriophage conducted by Dr. Albert P. Krueger, University of California Medical School, Berkeley.

Society News.—Dr. Rudolf Schindler, Chicago, will address a special meeting of the San Francisco County Medical Society, May 1, on "Gastroscopy—Early Diagnosis and Prognosis of Gastric Carcinoma." —— Dr. Ralph K. Ghormley, Rochester, Minn., addressed the Los Angeles Surgical Society, April 12, on "Choice of Bone Graft Methods in Bone and Joint Surgery."

Public Lectures on Health.—The speakers' bureau of the Los Angeles County Medical Association is sponsoring a group of lectures on health at the Los Angeles Public Library. The following participated in the series April 4:

Dr. James C. Doyle, The Menopause.
Dr. George E. Judd, Gonorrhea in Women.
Dr. Frederick B. Zombro, Hematuria and Its Significance.
Dr. Arthur Elmer Belt, Glands and the Urinary Tract; Venereal Disease and Its Control.

Personal.—Dr. George Parrish was honored at a meeting of employees of the Los Angeles Department of Health in observance of his completion of fifteen years as city health officer.——Dr. Francis S. Smyth, professor of pediatrics, University of California Medical School, San Francisco, is spending his sabbatical leave of absence in Buenos Aires, where he is working with Prof. Bernardo A. Houssay, director of the Physiological Institute, University of Buenos Aires, on hypophysial diabetes.

COLORADO

Annual Spring Clinics.—The seventh annual spring clinics, presented by the Pueblo County Medical Society, will be held at Pueblo, May 9-10, with headquarters at the Congress Hotel. The staffs of Corwin, Colorado, St. Mary and Parkview hospitals are cooperating in presenting the clinics. The guest speakers include:

Dr. Davis Spangler, Dallas, Texas, X-Ray and Radium Therapy in Uterine Bleeding.
Dr. Sylvia Allen, Topeka, Kan., Psychiatry in Internal Medicine.
Dr. Henry N. Tiben, Wichita, Kan., Peptic Ulcer—Problems and Management.
Dr. Buford G. Hamilton, Kansas City, Mo., Fundamentals That Are to Be Observed During Labor and the Postpartum Period.

ILLINOIS

Society News.—Dr. Charles C. Dennie, Kansas City, Mo., discussed "The Management of Wassermann-Fast Cases" before the Peoria City Medical Society, April 2. —— Dr. Otto H. Schwarz, St. Louis, discussed "Obstetric Hemorrhages" before the Christian County Medical Society at Taylorville, March 27, and Dr. Walter M. Whitaker, Quincy, "The Allergic Child." —— Dr. William J. Engel, Cleveland, addressed the Sangamon County Medical Society in Springfield, March 7, on "Factors Responsible for the Lower Mortality in Prostatic Surgery."——Dr. Walter Schiller, Chicago, addressed the St. Clair County Medical Society in East St. Louis, March 7, on "Clinical Diagnosis of Ovarian Diseases." —— Dr. Alphonse McMahon, St. Louis, discussed "Aminophyllin: Its Uses and Effect upon the Electrocardiogram" before the Adams County Medical Society, March 11, in Quincy. ——The Jersey-Greene County Medical Society was addressed in Carrollton, March 8, by Drs. Henry Buxbaum and H. William Elghammer, Chicago, on "Indications and Technic of Cephalic and Podalic Version" and "Rheumatic Heart Disease in Children" respectively.

Chicago

Postgraduate Courses on Obstetrics.—The University of Chicago and the Chicago Lying-In Hospital, in cooperation with the state department of health and the U. S. Children's Bureau, are offering postgraduate courses in obstetrics for physicians, extending from April 29 to June 8 and from June 17 to July 20. The only expense to the physicians will be for board and room, personal incidental expenses and a fee of $15. Applications and inquiries should be addressed to Postgraduate Course, Department of Obstetrics and Gynecology, 5848 Drexel Avenue, Chicago.

Warning Against Impostor.—A man calling himself Dr. William H. Haid cashed a check at Northwestern University, March 29, drawn on the North Shore National Bank of Chicago. The check was returned marked "no account." Haid had said that he was at the university getting reprints on articles in connection with research work he was doing at the Petrolagar Laboratories, Niles Center. Investigation revealed that the laboratories did not employ any one by the name of Haid. Five days after cashing the check Haid called by telephone stating that he had drawn a check on the wrong bank and that he would be in and make it good in a day or so. Three days later he sent a card stating that he had been out of town but would come in the next day and take care of his obligation. The card was signed "Wm. H. Haid, M.D." and was mailed from Maywood, Ill. He is described as 6 feet tall, aged between 30 and 32, with a round face, sharp pointed nose and a high forehead with hair thinning in front. He was dressed in a light suit, gray hat and green topcoat and presented a neat appearance. THE JOURNAL (Jan. 19, 1935, p. 237) carried a news item describing similar activities in Cleveland of an impostor using the same name. At that time newspapers reported that a William H. Haid, who is said once to have held a position with the Chicago department of health, had been arrested in Boston in 1931 on a charge of passing worthless checks and sentenced to serve a month in the house of correction. There is no Dr. William H. Haid listed in the last edition of the American Medical Directory.

INDIANA

Personal.—Dr. Oscar S. Heller, Greenfield, has been appointed health officer of Hancock County, succeeding the late Dr. James B. Ellingwood, Fortville. Dr. Heller formerly held the position.——Dr. Jerome V. Pace, who has been superintendent of the Indiana State Sanatorium, Rockville, since 1931, has been appointed head of the new southern Indiana tuberculosis hospital, Silver Crest, at New Albany. Dr. Robert A. Staff, superintendent of Smith-Esteb Memorial Hospital, Richmond, since 1936, has been appointed superintendent of the state tuberculosis sanatorium, succeeding Dr. Pace.

Memorial to Jane Todd Crawford.—A monument to Jane Todd Crawford will be dedicated, May 11, at her grave in Johnson Cemetery, Sullivan. The inscription reads:

Jane Todd Crawford, born in Rockbridge County, Virginia, December 23, 1763, married Thomas Crawford January 5, 1794, settled in Green County, Kentucky, November 5, 1803, suffering from an ovarian tumor and realizing that her only hope was a surgical operation, frankly experimental, this heroine, though in great pain, rode fifty miles horseback over rough trails to the home of Dr. Ephraim McDowell at Danville, Kentucky, where on December 25, 1809, antedating anesthesia, she submitted to the first ovariotomy and thus became the pioneer patient in abdominal surgery. Restored to health she lived for thirty-two years.
Erected by the Indiana Hospital Association, Section of the American Hospital Association, National Hospital Day, May 12, 1940.

KANSAS

The Porter Lectureship in Medicine.—Dr. Russell L. Haden, director of medicine, Cleveland Clinic, Cleveland, will deliver the tenth course of lectures under the Porter Lectureship in Medicine of the University of Kansas. The first and third lectures will be held in the medical school, Kansas City, and the second at Lawrence. The schedule is: April 30, "Hemolytic Anemia"; May 1, "The Red Blood Cell of Man," and, in the evening, "Polycythemia."

Society News.—The Central Kansas Medical Society was addressed in Hays, March 7, by Drs. Charles E. Walker Jr., Denver, on "Eye Conditions of Interest to the General Prac-

titioner"; Warren W. Tucker, Denver, "X-Ray Diagnosis of Placenta Praevia," and Daniel R. Higbee, Denver, "Tumors of the Kidney."——Dr. John A. Dillon, Larned, addressed the Ford County Medical Society in Dodge City, March 8, on "What the General Practitioner Should Know About Insanity."——The Shawnee County Medical Society was addressed in Topeka, March 4, by Drs. Clyde B. Trees, Topeka, on "Use of Carrel-Dakin Solution in the Treatment of Compound Fractures"; Leo A. Smith, Topeka, "Perianal and Perirectal Infections," and George F. Helwig, Topeka, "Blood Transfusions."——Dr. Millard F. Arbuckle, St. Louis, addressed the Sedgwick County Medical Society in Wichita, March 16, on "Value of Bronchoscopy in the Diagnosis and Treatment of Pulmonary Diseases."——Dr. Peter T. Bohan, Kansas City, Mo., addressed the Wyandotte County Medical Society, Kansas City, March 5, on "Clinical Approach to the Recognition of Functional Diseases."

LOUISIANA

Dr. Boyce Wins Gross Prize.—Dr. Frederick F. Boyce, assistant professor of surgery, Graduate School of Medicine of Louisiana State University, New Orleans, has been awarded the 1940 Samuel D. Gross Prize for his research entitled "The Role of the Liver in Surgery." The prize, which is $1,500, is offered every five years by the Philadelphia Academy of Surgery for original research work in the field of surgery. By the terms of the award the material is later published as a monograph. Dr. Boyce graduated at Yale University School of Medicine, New Haven, Conn., in 1930. He was the first man in Louisiana to be certified by examination by the American Board of Surgery. He formerly was full time assistant professor of surgery at Louisiana State University School of Medicine.

MICHIGAN

Campaign Against Rabies.—Because the rabies situation in Michigan has grown rapidly worse in the past year, five state departments, including the governor's office, have started a united attack on rabies in Michigan. Dr. Arthur W. Newitt, director, bureau of epidemiology, state department of health, and C. H. Clark, state veterinarian and director of veterinary activities, state department of agriculture, have been named to direct the program. The situation was reviewed at a meeting, March 14, in the office of the state health commissioner, Dr. Henry Allen Moyer, attended by E. A. Beamer, commissioner of the department of agriculture; H. D. Ruhl, chief of the game division of the conservation department; Emerson R. Boyles, legal adviser to Governor Dickinson; Sergeant Lawrence Meehan, representing Oscar G. Olander, state police commissioner; Clifford C. Young, D.P.H., director of the laboratories of the state health department, Dr. Clark and Dr. Newitt. Dog quarantines have been established in six counties in the state. In 1939 more than 65,000 doses of vaccine were produced by the state health department laboratories, enough to treat more than 400 persons a month bitten by dogs known to be or suspected of being mad. More than 100 dog heads a month are now being examined for rabies, it was stated.

MINNESOTA

Wright Lecture on Urology.—Dr. Reed M. Nesbit, associate professor of surgery, University of Michigan Medical School, Ann Arbor, will deliver the Franklin R. Wright lecture at the annual meeting of the Twin City Urological Society, Minneapolis, May 7. His subject will be "Hypertension in Unilateral Renal Disease."

MISSOURI

The St. Louis Clinics.—The annual postgraduate course and clinical conference of the St. Louis Clinics will be held in the St. Louis Medical Society Building, St. Louis, May 13-16. A medicomilitary symposium will open the conference with the following speakers:

Col. Carl H. Muller, St. Louis, Training of Reserve Officers and Mobilization.
Lieut. Sam A. Bassett, St. Louis, Military Flight Physical Rejections; An Evaluation of Reconstruction Efforts.
Lieut. Col. John P. Beeson, Omaha, Medical Problems of a Nation at War.
Capt. George D. Newton, St. Louis, Tactical Employment of Chemical Troops in Attack; Medical Service of the Square Division; Medical Service of the Triangular Division.
Comdr. Rutherford B. H. Gradwohl, St. Louis, New Facts on Blood Groups with Special Reference to Military Purposes.
Rear Admiral Ross T. McIntire, Washington, D. C., surgeon general, U. S. Navy, Casualties at Sea.
Lieut. Col. Egbert E. Brown, St. Louis, Contribution of the Medical Corps to the People of the United States.
Lieut. Col. Charles L. Maxwell, Belleville, Ill., Neurocirculatory Asthenia in Aviation Medicine.
Lieut. Col. Guy B. Denit, Fort Leavenworth, Kan., Medical Service of a Field Force.

The remainder of the program will be devoted to a wide range of medical subjects. One evening session will be addressed by Dr. George R. Herrmann, professor of clinical medicine, University of Texas School of Medicine, Galveston, on "Management of the Commoner Types of Cardiac Emergencies." A round table luncheon, Thursday, will be addressed by Dr. Willard M. Allen, assistant professor of obstetrics and gynecology, University of Rochester School of Medicine, Rochester, N. Y., on "Female Sex Hormones."

NEW MEXICO

Society News.—Dr. Nancy D. Campbell, Las Vegas, addressed the Las Vegas Medical Society recently on "Malignancies of the Female Pelvis." Dr. John J. Johnson Jr., Las Vegas, discussed sulfapyridine at a recent meeting. There was also a discussion of the medical plan of the Farm Security Administration at the latter meeting. Dr. Harrison Eilers, Las Vegas, spoke, March 13, on undulant fever.

NEW YORK

State Medical Meeting in New York.—The annual meeting of the Medical Society of the State of New York will be held at the Waldorf-Astoria, New York, May 6-9, under the presidency of Dr. Terry M. Townsend, New York. There will be general sessions, an Army and Navy program Tuesday afternoon, May 7, and a symposium Thursday afternoon, May 9, on "Early Recognition of Serious Lesions in Special Fields of Medicine." Speakers on the military program will be:

Capt. Harry G. Armstrong, U. S. Army, Dayton, Ohio, General Medical Problems in Aviation.
Capt. Lucius W. Johnson, U. S. Navy, Washington, D. C., Problems of Diving and Submarines.
Lieut. Col. William D. Fleming, U. S. Army, Washington, D. C., Medical Problems in Aviation.
Lieut. Albert R. Behnke Jr., U. S. Navy, Washington, D. C., Noise in Relation to Hearing and Efficiency.

Speakers in the symposium will be: Drs. Francis Heed Adler, Philadelphia, for ophthalmology; George M. Coates, Philadelphia, for otolaryngology; James Raglan Miller, Hartford, Conn., for gynecology, and Hugh H. Young, Baltimore, for urology (the A. Walter Suiter Lecture). In addition, there will be many guest speakers before section meetings, including the following:

Dr. Frank H. Lahey, Boston, Ulcerative Colitis.
Dr. Charles H. Best, Toronto, Ont., Heparin.
Dr. Nicholson J. Eastman, Baltimore, Hazards Associated with Pregnancy and Labor in the Grande Multipara.
Dr. Harrison S. Martland, Newark, N. J., Technic of the Medicolegal Autopsy.
Dr. Joseph K. Calvin, Chicago, Tetanus—Its Prevention and Treatment.
Dr. Frank G. Boudreau, New York, Epidemic Hazards in War.
Dr. James T. Priestley, Rochester, Minn., Surgical Treatment of Carcinoma of the Bladder.
Dr. Augustus McCravey, Philadelphia, Refrigeration Treatment of Tumors of the Genito-Urinary Tract.

Among other features of the program are a round table discussion of "Present Status of Therapy in Neoplastic Diseases—An Attack on Undifferentiated Cell Activity from the Physical Standpoint," led by Drs. Temple S. Fay and Lawrence W. Smith, Philadelphia, as well as symposiums on chronic diseases, fractures involving joints, carcinoma of the genito-urinary tract, urologic disease and hypertension and participation in the public health program. The Woman's Auxiliary will also hold its meeting at the Waldorf, May 6-9, with a hobby show as a special feature.

New York City

Biggs Memorial Lecture.—Dr. Paul Dudley White, Boston, delivered the fifteenth Hermann Michael Biggs Memorial Lecture of the New York Academy of Medicine, April 4. His subject was "Heart Disease—A World Problem."

The Adam Miller Memorial Lecture.—Dr. Thomas Addis, professor of medicine, Stanford University School of Medicine, San Francisco, will deliver the Adam M. Miller Memorial Lecture at the Long Island College of Medicine, Brooklyn, May 1, on "The Anatomical and Physiological Concepts Underlying the Treatment of Glomerular Nephritis."

Appointments at Columbia.—Dr. Ernest L. Stebbins, assistant commissioner for preventable diseases, New York State Department of Health, has been appointed professor of epidemiology at Columbia University College of Physicians and Surgeons, and John W. Fertig, Ph.D., associate in biostatistics, Johns Hopkins University School of

Hygiene and Public Health, Baltimore, has been made professor of biostatistics. Dr. Stebbins graduated at Rush Medical College in 1930. He served three years in the Virginia State Department of Health, joining the staff of the New York department of health in 1934 as an epidemiologist. In 1936 he became health officer of the Rochester district and in 1937 director of the division of communicable diseases. Dr. Fertig took the degree of doctor of philosophy in 1935 at the University of Minnesota. He was associate biometrician at the Memorial Foundation for Neuro-Endocrine Research, Worcester, Mass., for two years before going to Johns Hopkins in 1937.

NORTH DAKOTA

Personal.—Dr. Albert M. Fisher, Bismarck, has been appointed superintendent of the North Dakota State Hospital for the Insane, Jamestown, to succeed Dr. Frederick C. Lorenzen.

Society News.—Dr. Victor J. LaRose, Bismarck, was reelected president of the North Dakota Anti-Tuberculosis Association at its recent annual meeting.——Dr. Henning Milton Berg, Bismarck, addressed the Stutsman County Medical Society, Jamestown, recently on "Radiation Therapy of Cancer."

OHIO

Senator Taft to Address State Meeting.—Senator Robert A. Taft of Cincinnati, candidate for the Republican nomination for president, will be the guest speaker at the annual banquet of the Ohio State Medical Association, Thursday evening, May 16, at the Netherland-Plaza Hotel, Cincinnati. Senator Taft is a member of the U. S. Senate committee on education and labor, to which a number of important medical and health proposals have been referred. The address will be broadcast on a nationwide hookup of the Columbia Broadcasting System from 9:15 to 9:30 p. m., eastern standard time.

OREGON

Society News.—Dr. Karl H. Martzloff, Portland, addressed the Lane County Medical Society, Eugene, March 15, on "Fundamental Considerations in the Technic of Intestinal Anastomosis."——Dr. Joyle O. Dahl, Portland, addressed the Central Willamette Medical Society in Corvallis, March 7, on "Modern Diagnosis and Treatment of Syphilis."——Dr. Walter L. Kelsey addressed the Multnomah County Medical Society, Portland, March 20, on "Postoperative Pulmonary Complications."——Dr. Moses E. Steinberg, Portland, addressed the Columbia County Medical Society, Clatskanie, March 13, on gastroscopy.——Dr. Thomas R. Montgomery, Portland, discussed "Plans of Urethral Surgery and Surgery of the Prostate" at a meeting of the Polk-Yamhill-Marion Counties Medical Society, March 12.

Alumni Meeting.—The annual postgraduate session of the University of Oregon Medical School Alumni Association will be held in Portland, May 1-3, under the presidency of Dr. Thomas D. Robertson, Portland. Among the speakers will be:

Dr. Joseph A. Berman, Portland, Functions of the Crime Detection Laboratory.
Dr. Frederick H. Falls, Chicago, Diagnosis and Management of Ectopic Pregnancy.
Dr. Edwin G. Bannick, Seattle, Present Status of Sulfanilamide and Similar Compounds.
Dr. Harry F. Dietrich, Los Angeles, High Temperatures in Infancy and Childhood.
Dr. Ira A. Manville, Portland, Diabetes: Consideration of Protamine Insulin, Management of the Surgical Diabetic and Management of Diabetic Coma.
Dr. Robert L. Benson, Portland, Allergy, with Special Attention to the Diagnosis and Treatment of Hay Fever and Asthma.
Dr. William K. Livingston, Portland, Peripheral Vascular Disease, Diagnosis and Treatment.

Clinics and round table luncheons will also be included in the program. The session will end with the annual banquet.

PENNSYLVANIA

Annual Tuberculosis Meeting.—The Pennsylvania Tuberculosis Society will hold its forty-eighth annual meeting in Williamsport, May 9-10. Among the speakers will be Dr. William A. Sawyer, Rochester, N. Y., on "Industry's Opportunity and Responsibility in the Task of Eradicating Tuberculosis"; Col. Arthur Parker Hitchens, Philadelphia, "The Role of the Health Officer in the Tuberculosis Program"; Dr. John S. Packard, Allenwood, "Diagnosis and Treatment of Tuberculous Tracheobronchitis," and Dr. Esmond R. Long, Philadelphia, "Tuberculin Test and Roentgen Ray in Tuberculosis Case Finding."

Philadelphia

Strittmatter Award to State Health Officer.—Dr. John J. Shaw, state secretary of health, Harrisburg, received the Strittmatter Award of the Philadelphia County Medical Society at a meeting April 10. Dr. Jacob Parsons Schaeffer, chairman of the award committee, presented the gold medal to Dr. Shaw with a scroll complimenting his service as health officer "in effectively organizing and, through conference with recognized individuals and groups, coordinating the many and varied health agencies and activities of the state." Dr. Shaw, a resident of Philadelphia, was appointed by Governor James in January 1939. The annual John Chalmers Da Costa Oration was delivered at this meeting by Dr. Charles Gordon Heyd, New York, on "The Evolution of Modern Surgery."

SOUTH CAROLINA

State Medical Meeting at Charleston.—The ninety-second annual meeting of the South Carolina Medical Association will be held at the Francis Marion Hotel in Charleston, April 30-May 2, under the presidency of Dr. Douglas Jennings, Bennettsville. The guest speakers will be Drs. Louis A. Buie, Rochester, Minn., on "Management of Common Anorectal Conditions," and Oscar W. Bethea, New Orleans, on "Heart Pain." South Carolina speakers will include:

Drs. Gertrude R. Holmes and Hugh P. Smith, Greenville, Chronic Conditions of the Gallbladder.
Dr. Alfred F. Burnside, Columbia, Regional Ileitis.
Dr. James T. Quattlebaum, Columbia, Intravenous Therapy in the Treatment of Acute Heart Failure.
Dr. James A. Sasser, Conway, Conservative Management of Pelvic Infections.
Dr. Gerald E. McDaniel, Columbia, Poliomyelitis.
Dr. Roger G. Doughty, Columbia, Diagnosis and Management of Carcinoma of the Colon.
Dr. Joseph Decherd Guess, Greenville, Some Observations on the Conduct of Labor.
Drs. Robert Stith Jr. and Walter R. Mead, Florence, The Male Climacteric.
Dr. Everett B. Poole, Greenville, Chronic Tetany.
Dr. George T. McCutchen, Columbia, Observations of Plastic Surgical Procedures.

The chief feature of the meeting will be the formal dedication of a new building for the Medical College of the State of South Carolina, Wednesday afternoon, May 1. Gov. Burnett R. Maybank will deliver an address and the American Legion will present its distinguished service plaque to Dr. Robert Wilson, dean of the college.

VIRGINIA

Portrait of Dr. James Tate Mason.—A portrait of the late Dr. James Tate Mason, Seattle, was presented to the University of Virginia Department of Medicine, Charlottesville, April 13, by members of his class at the university and other friends. Dr. Mason, who died in 1936 a few weeks after he was installed in absentia as President of the American Medical Association, graduated from the University of Virginia Department of Medicine in 1905.

WASHINGTON

Annual Summer Course at University of Washington.—Announcement is made of the twenty-fourth annual graduate medical course at the University of Washington, Seattle, to be held July 15-19. The guests will be Drs. Soma Weiss, Boston, on medical topics; Charles F. McKhann, Boston, pediatrics; Richard B. Cattell, Boston, surgery, and Chauncey D. Leake, Ph.D., San Francisco, pharmacology.

Society News.—Dr. Carl P. Wagoner, Seattle, addressed the Pierce County Medical Society, Tacoma, recently on the common cold.——At a meeting of the King County Medical Society, Seattle, March 18, the speakers were Drs. Clark C. Goss on "Chronic Undulant Fever"; Alexander R. Altose, "Treatment of Certain Allergic Conditions with Histaminase," and Walter L. Voegtlin, "Treatment of Alcoholism by Establishing a Conditioned Reflex."——Drs. Homer P. Rush and Edgar Merle Taylor, Portland, Ore., addressed the Walla Walla Valley Medical Society, Walla Walla, March 14, on high blood pressure. Dr. Edward W. St. Pierre, Portland, Ore., addressed the society, April 11, on "Carcinoma of the Stomach and Colon."

WISCONSIN

State Journal Honors Dr. Woodward.—The *Wisconsin Medical Journal* dedicated its April issue to Dr. William C. Woodward, director of the Bureau of Legal Medicine and Legislation of the American Medical Association for eighteen years before his retirement January 1. The journal reviewed Dr. Woodward's career in medicine and law and paid tribute

to his contributions to public health. A part of the editorial reads: "Dr. Woodward is learned not alone in the science of medicine, in the realm of law and the translation of the advances of science into the protection of the people by law. His is the richer and deeper learning of how to work with men. And because all of this lies in a man of directness, simplicity and public purpose, his contributions to the cause of public health are not to be measured in this generation."

Cancer Laboratory Opened at Madison.—The Michael W. McArdle Memorial Laboratory for Cancer Research was opened February 26 at the University of Wisconsin, Madison. The therapy department includes two high voltage therapy rooms, one with a 400,000 volt unit and the other with a 200,000 volt unit. There are also a superficial therapy room, a radium room, a waiting room and offices on the first floor. The basement has storage rooms and a radon plant. The new laboratory was built with funds from a federal PWA grant and from a gift of stocks and property bequeathed by the late Mr. McArdle of Chicago. The center broadens the university's cancer work, which began five years ago with the Bowman fund, established to provide fellowships for research. The building committee included Walter J. Meek, Ph.D., professor of physiology and assistant dean of the medical school; Dr. William D. Stovall, acting superintendent of the Wisconsin General Hospital, and Dr. Ernest A. Pohle, professor of radiology.

GENERAL

Brinkley's Appeal for Rehearing Denied.—On April 19 the United States Circuit Court of Appeals for the fifth circuit at New Orleans denied the petition of J. R. Brinkley for a rehearing in the case of *J. R. Brinkley* v. *Morris Fishbein.* No opinion was rendered in connection with the denial.

Midwest Safety Conference.—The eighteenth annual Midwest Safety Conference will be held at the Sherman Hotel, Chicago, April 30-May 2, under the auspices of the Greater Chicago Safety Council, the Illinois Industrial Commission and other agencies. There will be sessions on fundamental causes of accidents in industry, public safety education, first aid in industry and other phases of safety work. A session on industrial hygiene will be sponsored jointly with the Chicago section of the American Industrial Hygiene Association.

Vitamin Hearings for April 29 Revoked.—It was announced in THE JOURNAL, April 20, page 1539, and in other publications that there would be a hearing on proposed regulations for special dietary foods and vitamin preparations. These hearings have been revoked, as have also the hearings set for May 13 on standards of identity for flour. Officials explained that the U. S. Department of Agriculture could not complete regulations based on these hearings before the scheduled date of the proposed transfer of the Food and Drug Administration to the Federal Security Agency under the President's Reorganization Plan No. 4.

American College of Physicians.—Dr. Roger I. Lee, Boston, a Trustee of the American Medical Association, was named president-elect of the American College of Physicians at the annual session in Cleveland, April 1-5, and Dr. James D. Bruce, Ann Arbor, Mich., was installed as president. Vice presidents elected were Drs. Robert A. Cooke, New York; James G. Carr, Chicago, and Henry M. Thomas Jr., Baltimore. Drs. William Gerry Morgan, Washington, D. C., and James B. Herrick, Chicago, received the title of "master" of the college, the first time this honor had been conferred in eleven years. Only six physicians have previously been so honored.

American Orthopaedic Association.—The annual meeting of the American Orthopaedic Association will be held in Kansas City, Mo., May 6-9. The second day will be devoted to a symposium on "The Incidence, Significance and Treatment of Sciatic Pain in Low Back Cases" with the following speakers, among others: Drs. Theodore A. Willis and Clarence H. Heyman, Cleveland; Winchell McK. Craig and Henry W. Meyerding, Rochester, Minn.; John G. Kuhns, Joseph S. Barr, William Jason Mixter and Marius N. Smith-Petersen, all of Boston; Benjamin P. Farrell, New York; Albert H. Freiberg, Cincinnati, and Carl E. Badgley, Ann Arbor, Mich. Among other papers will be:

Dr. Alfred R. Shands Jr., Wilmington, Del., A Survey of Orthopedic Research in the United States and Canada.
Dr. Philip D. Wilson, New York, Two-Stage Transplantation of the Fibula for Complicated Pseudarthrosis of the Tibia.
Dr. Wallace H. Cole, St. Paul, Claw-Foot.
Dr. Willis C. Campbell, Memphis, Tenn., Sulfanilamide in the Treatment of Compound Fractures.

American Surgical Association.—The annual meeting of the American Surgical Association will be held in St. Louis, May 1-3, at Washington University under the presidency of Dr. Allen O. Whipple, New York. The first day will be devoted to a symposium of eleven papers on "Fluid and Electrolyte Needs of the Surgical Patient" presented by Drs. John P. Peters, New Haven, Conn.; David C. Bull and Charles R. Drew, New York; John Scudder, New York; Walter G. Maddock, Ann Arbor, Mich.; Grover C. Penberthy and Robert Mayo Tenery with J. Logan Irvin, Ph.D., Detroit; Jacob Fine, Boston; Isidor S. Ravdin and William Osler Abbott, Philadelphia; Robert Elman, St. Louis, and Carl W. Walter, Boston, and Ann S. Minot, Ph.D., Nashville, Tenn. Among other papers will be:

Dr. Jonathan E. Rhoads, Philadelphia, Physiologic Factors Regulating the Level of the Plasma Prothrombin.
Dr. Henry K. Ransom, Ann Arbor, Mich., Abdominal Neoplasms of Neurogenic Origin.
Drs. Edwin P. Lehman and Floyd E. Boys, Charlottesville, Va., Heparin in the Prevention of Peritoneal Adhesions: Report of Progress.
Dr. Daniel C. Elkin, Atlanta, Ga., Aneurysm of the Abdominal Aorta: Successful Treatment by Ligation.
Drs. John Albert Key and Charles J. Frankel, St. Louis, Relative Local Efficiency of Sulfanilamide, Sulfapyridine and Sulfathiazole in Contaminated Wounds.
Drs. Frank W. Hartman and Roy D. McClure, Detroit, Further Anesthesia Studies with Photoelectric Oxyhemoglobinograph.
Dr. Reginald H. Smithwick, Boston, Problem of Producing Complete and Lasting Sympathetic Denervation of Upper Extremity by Preganglionic Section.

The Accident Record for 1939.—The National Safety Council in its preliminary report of accidental deaths in 1939 announced a total of 93,000, which was 1 per cent below the total for 1938. Motor vehicle accident fatalities were practically the same as in 1938, approximately 32,600. Deaths due to occupational and public (not motor vehicle) accidents decreased; occupational from 16,500 to 16,000 and public not involving a motor vehicle from 16,000 to 15,000. Home accident deaths increased from 31,500 to 32,000. The death rate of 71 per hundred thousand of population was the lowest since 1900, with the exception of 1921 and 1922, the report said.

Although traffic deaths as a whole did not decline, the mileage death rate decreased for the fifth consecutive year. In 1939 motor vehicle travel increased 6 per cent and the number of motor vehicles in use increased 4 per cent. In addition to the 32,600 deaths, traffic accidents caused about 1,150,000 nonfatal injuries, of which 90,000 caused permanent disabilities.

City traffic figures showed an average reduction of 3 per cent, but the report points out that less than a third of the death toll occurs in cities of more than 10,000 population. The number of deaths in rural areas and cities under 10,000 was more than 23,000. In the past ten years the urban deaths have declined 24 per cent while those in rural areas and small cities have increased 23 per cent.

Analysis of traffic deaths in groups of cities showed that Milwaukee led cities of more than 500,000 with a death rate of 9.3. In the group with populations between 250,000 and 500,000 Providence, R. I., held top rank with a rate of 5.5. Worcester, Mass., led the group of cities between 100,000 and 250,000 with 5.1 and four other Massachusetts cities were next in order in the group, Cambridge, New Bedford, Fall River and Springfield. In the fourth group Hoboken, N. J., was first with 1.7 deaths per hundred thousand. Forty-six cities with populations between 10,000 and 50,000 completed the year without a traffic fatality. About 12,200 pedestrians were injured in 1939, 3 per cent below the 1938 figure.

Of the 32,000 home accidents, 17,000 were caused by falls. Burns and fires killed approximately 5,700, or 400 more than in 1938.

The public (not motor vehicle) accident total of 15,000 for 1939 was the lowest for any year since estimates were first made in 1928 and was 6 per cent under the 1938 record. At least half the decrease was in drownings, which dropped from 4,700 in 1938 to about 4,200 in 1939. There were 1,750,000 nonfatal injuries in this classification.

Steam railroad accidents in the first ten months of 1939 resulted in 3,664 deaths and 22,884 nonfatal injuries, a 2 per cent decrease in deaths and a 3 per cent increase in injuries. Deaths of passengers on trains amounted to twenty-three, compared to sixty-five in 1938, when the Montana train wreck occurred. Deaths of employees on duty went up 3 per cent from 399 to 412. Trespasser deaths increased from 2,014 to 2,021.

Aviation made the best record in its history. The passenger death rate per hundred million passenger-miles was 1.2, as compared with 4.5 in 1938 and with 28.6 in 1930.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 23, 1940.

Professor Hill Sent to Washington

Prof. Archibald Vivian Hill, F.R.S., who has recently become a member of parliament, has been appointed assistant air attaché in Washington for special scientific liaison. Professor Hill is a leading physiologist whose specialty is biophysics. Among many distinctions, he has obtained the Nobel prize for medicine, though he has never qualified as a physician. He has been director of the antiaircraft section of the Munitions Inventions Department. He is well known in America, where he delivered the Herter lectures at Baltimore and the Lowell lectures at Boston.

The Conscription of Physicians

Before the outbreak of war the majority of physicians of military age voluntarily enrolled for war service in response to the request of the government. Subsequently conscription was adopted of all men of 21 years and then of older men by successive years of age. The application of conscription was not universal, as men in certain occupations held to be of national importance were exempted. Among the exempted occupations is the medical profession. The Central Emergency Committee of the British Medical Association has now unanimously recommended that physicians be removed from the list of reserved occupations. If this proposal is accepted, physicians who have not yet reached the age of 28 years will become liable for compulsory service with the fighting forces in a medical capacity. Those at older ages would automatically become liable as the proclamation age is raised. The committee does not desire that compulsion should be applied within six months of qualification. Under existing arrangements those who obtain resident posts at hospitals within the six months period will be permitted to complete their appointment if it is not more than six months. Many of the older physicians, with heavy obligations, have joined up and therefore the committee feels that it would be fairer if medicine was withdrawn from the reserved occupations.

Arrangements for Treatment of Air Raid Casualties

Air raid casualties on a large scale have not occurred, probably because the enemy realizes the consequences to him if he bombs our cities. But our vast organization of precautions is maintained. The Emergency Medical Service is an example. Initial treatment for minor injuries will be provided, as far as possible, at first aid posts. Any further treatment, as well as treatment required by casualties after discharge from hospitals, will be provided at their outpatient departments. Some subsequent treatment which cannot be provided at the hospital may be necessary, and the cost of domiciliary treatment of any injury in an air raid will be paid by the government according to arrangements now made. These apply to injuries sustained by civilians as the result of enemy action, at sea as well as in England, and also to injuries sustained by civil defense volunteers in the course of their duty, whether caused by enemy action or not. It has been agreed between the Ministry of Health and the British Medical Association that a capitation fee of $3 shall be paid to physicians by the government for each civilian who receives domiciliary treatment for any of the injuries described. The cost of any drugs or dressings needed for domiciliary treatment will also be paid by the government. Should complications occur which necessitate further inpatient treatment or special treatment outside the physician's purview, he must refer the patient back to the hospital.

The Chemotherapy of War Wounds

A medical society has been formed by the medical officers of the British Expeditionary Force in France. The opening paper, on the chemotherapy of war wounds, was given by Col. Leonard Colebrook, bacteriologist, who pointed out that the most striking lesson of the great war was the predominant part played by hemolytic streptococci in wound infections. Probably this one microbe was responsible for 70 per cent of all the deaths due to infections of wounds. It also gave rise to most of the complications, such as erysipelas, cellulitis and septicemia. Of forty-nine positive blood cultures obtained from men with septic compound fractures of the femur, forty-four showed pure cultures of hemolytic streptococci. Unfortunately it was not learned whether in most cases the organisms were carried into the tissues at the time of wounding or whether they were transmitted from case to case in the hospitals or disseminated by dust or by carriers in the respiratory tract. Stokes and Tyler found that about 15 per cent of wounds were already infected by hemolytic streptococci on admission to the casualty clearing station (average twelve hours after the wounds were inflicted), while a much larger proportion were found infected on examination after a few days at the base. A figure as high as 90 per cent was given for one hospital. These figures suggested that hospital infection played a sinister part.

It is necessary to learn how to control these infections. Experiments on mice had shown that injections of sulfapyridine or sulfanilamide before the mice were infected protected them. It seemed clear that if a certain amount of sulfanilamide was present in the circulating blood at the time streptococci reached the tissues, they were prevented from causing an acute infection. If the microbes were implanted when the man was hit, prophylactic treatment must be started at the earliest possible moment. But in planning preventive measures we were up against the difficulty that infection was not always caused at the time the man was wounded but might occur in the hospital during the next few days. A single prophylactic dose given by mouth shortly after the injury would be almost all excreted within ten to twenty hours. Therefore in order to maintain the necessary concentration in the blood during the whole period of danger, administration must be continued for at least four days. By the end of that time the injured tissues would presumably be walled off by the process of repair, and if infection occurred it would be much less serious.

The dosage for successful prophylaxis in man could not yet be stated dogmatically. However, Fuller and James had recently produced data which suggested a plan of dosage designed for rapid absorption during the first few hours and slow continuous absorption afterward: First dose, 1.5 Gm. of sulfanilamide (three tablets) dissolved in 100 cc. of 1 per cent hot citric acid solution or hot lemon. Second dose, two hours later, 0.5 Gm. (one tablet whole or partly crushed in order to delay absorption). Subsequent doses, 0.5 Gm., whole or partly crushed, at four hourly intervals for four days. Total dose, 13.5 Gm. in four days. The blood concentrations from these doses in men suffering from shock would have to be checked to ensure that they corresponded with those obtained by Fuller and James in normal men. Toxic effects should be noted. If the drug was well borne but did not prevent infection, larger doses should be tried.

For infections already established, the dosage did not much differ from that used in civil practice. There was some evidence that sulfapyridine was more effective than sulfanilamide in gas gangrene. To expedite its absorption the first three doses (1 Gm. each) should be given well crushed and dissolved as far as possible at an interval of from one to three hours. During the first twenty-four hours from 6 to 8 Gm. should be given and the dose slightly reduced next day if the clinical condition was much improved. For hemolytic streptococcus infection 1 Gm. of sulfanilamide should be given every four

hours for the first day or two and reduced with clinical improvement. For severe infections 8 Gm. should be given on the first day. The drug should be continued for four or five days after the temperature had dropped to normal and the clinical condition had become satisfactory, but it should not be continued after that time just because there were still streptococci in the discharges. Because of the danger of granulocytopenia from these drugs, a leukocyte count should be made on the seventh day of treatment in every case in which large doses were administered.

BUENOS AIRES

(From Our Regular Correspondent)

March 15, 1940.

An Argentine Hospital in France

As reported by the chairman of the Comisión Argentina pro Francia the hospital maintained in Paris with Argentine money has begun to function. It bears the name of Dr. Pedro Chutro, who rendered great service to the allied cause in the World War. The hospital is specially equipped for oxygen therapy and has already taken care of 165 patients. Two hundred Argentine pesos ($60) will defray the monthly expense of a bed.

Maternity and Child Welfare Centers

The national department of health, through its division on maternity and child welfare (dirección de maternidad y infancia), recently intensified its activities in the interior of the country. In all provinces and territories welfare centers have been established. These centers are not limited to giving direct medical aid but are engaged also in prophylaxis and social hygiene such as education for health, control of endemic diseases, and problems of nutrition. They even serve free meals. The centers are equipped to take care of varying local needs. Those with the simplest equipment have consultation bureaus for antepartum and postpartum care and for child welfare and prepare milk and other foods for infants. Fully developed centers contain wards for pregnant women and young mothers, a training school for mothers, a dental office, a milk laboratory and a kindergarten. During the past year 115,000 children were examined, 37,000 for the first time. Of these, 740 were hospitalized. More than 30,000 women were aided. In addition, obstetric and dental aid was given on many occasions, as well as other services furnished such as prophylactic vaccinations, clinical analyses, minor operations and ultraviolet treatments. More than 330,000 liters (348,480 quarts) of fresh milk, about 2,500 liters (2,640 quarts) of prepared milk, more than 800 Kg. of powdered milk, 150 Kg. of condensed milk and considerable quantities of flour, lactose and over 1,000,000 meals were dispensed to mothers and children. These centers also engaged in house visitations, in encouraging wedded cohabitation, in legitimatizing children, in finding jobs for unemployed heads of families, in placing children in private homes and in distribution of clothes. In the schools for mothers more than 500 lectures on health education were given. Additional centers are in preparation. Three traveling adjuncts to the center have been established, which give instruction in prophylaxis and hygiene and gather scientific data. They serve the three zones into which the country has been divided.

Sanitary Stations

In the Argentine province of Santa Fe, sixty sanitary stations have been constructed in rural districts. They not only furnish medical aid but are equipped with some beds. They also engage in the promotion of personal hygiene and furnish baths free of charge. Each station is to serve a community within a radius of 25 kilometers and is to function in cooperation with the nearest regional hospitals. The construction of each of these rural hospitals will cost about 34,300 Argentine pesos ($10,000).

Survey of Abnormal Children

The division of maternity and child aid conducted investigations during the middle of last year throughout Argentina to determine the number of children of school age that show signs of psychic abnormality, speech disorders and the like. A special bureau was established within the center that takes care of mothers and children and a system of classifying abnormalities worked out. The cases are divided into two classes: serious psychic abnormalities, such as idiocy and imbecility, and lighter kinds, such as speech and psychosensory disturbances. Most of the cases (92 per cent) found belong to the second class, in which improvement and cures can be expected. Means and measures for actual aid are yet to be elaborated.

BUDAPEST

(From Our Regular Correspondent)

March 8, 1940.

Fitness for Air Raid Precaution Work

Drs. Rácz Lajos and Telbisz Albert, regimental surgeons, studied the question Who are fit for air raid precaution work? They call attention to the difficulties of such service and delineate the lines on which suitable men can be selected. They observed that those who performed the work of air raid precaution easily and well, without gas mask and gas protecting suit, could perform the same work attired in gas protecting instruments either for a shorter period or by expressed overstraining of their organism. In such instances they felt palpitation, piercing pain over the heart, accelerated pulse, increase in the number of respirations, rise of the blood pressure and copious sweating, and in their head they felt a blunt pressure pulsation.

The work can be classified according to severity as: 1. Difficult work—making localities gas proof, searching for gas leaks, extinguishing fires and other work which has to be done in protective suits and oxygen inhalators. 2. Moderate work which has to be performed in gas masks. 3. Light work. When recruits are selected, men over 50 years of age should not be given work which has to be done in gas protecting suits. Inquiry should be made whether the applicant is accustomed to heavy work. Seemingly healthy subjects with a history of repeated tonsillitis, polyarthritis, syphilis or diphtheritis should be examined with special care. Persons who are unfit for this service include those suffering from exophthalmic goiter, hyperthyroidism, diabetes, Bright's disease with cardiorenal decompensation, and anemia, emphysema, or other pulmonary disease.

Marriages

William Henry Falor, Akron, Ohio, to Miss Ann Elizabeth Van Blaricom of Salem, at Leesburg, Va., March 9.

Horace E. Titsworth, Bandana, Ky., to Miss Dorothy Goodhue of Chattanooga, Tenn., March 1.

Guido A. De Blasio, Mount Vernon, N. Y., to Miss Amy Breyer of Nashville, Tenn., March 16.

Gertrude Emily Olsen, Pontiac, Mich., to Mr. Webster Saxman of Portland, Ind., March 26.

Simmons S. Smith to Miss Ruth Janis Whipple, both of Lakewood, Ohio, Nov. 5, 1939.

William Devereaux Jarratt Jr. to Miss Mary R. Volk, both of Macon, Ga., in March.

William L. Perry, Chesterfield, S. C., to Miss Ruth Kirven of Darlington, March 23.

Jack W. Miles to Miss Ruth B. Lewis, both of Columbus, Ohio, February 28.

Dwight I. Roush, Rutland, Ohio, to Miss Flora Hanes of Dayton, March 24.

Loren L. Frick, North Canton, Ohio, to Miss Helen Parsons at Kent in March.

Deaths

Sven Richard Lokrantz ● Los Angeles; Tufts College Medical School, Boston, 1918; past president of the Southern California Public Health Association and the American Association of School Physicians; director of health service, city schools; in 1932 was appointed medical director of the Olympic games by planning and carrying out a program of medical care, health supervision and first aid for the Olympic athletes; received honors from his own and foreign countries and knighthood from his native land of Sweden; on the staffs of the California Hospital, Babies' and Children's hospitals; consultant to the Orthopedic Hospital; aged 47; died, March 11, of a self-inflicted bullet wound.

David Nathaniel Roberg, San Jose, California; Rush Medical College, Chicago, 1908; member of the California Medical Association and the Pacific Coast Oto-Ophthalmological Society; professor of anatomy at the University of Oregon Medical School, Portland, 1910-1911, and professor of pathology from 1911 to 1913; commissioner of health of Oregon from 1915 to 1917 and 1919-1920; served during the World War; on the staff of the Santa Clara County Hospital; aged 55; died, February 20, of injuries received in an automobile accident.

Harry E. Marselus ● Dixon, Ill.; American College of Medicine and Surgery, Chicago, 1904; member of the American Psychiatric Association; on the staff of the Dixon State Hospital; formerly on the staffs of the Peoria (Ill.) State Hospital, Lincoln (Ill.) State Hospital and the East Moline (Ill.) State Hospital; aged 59; died, February 25, in Sheboygan, Wis., of coronary embolism and hypertension.

Herman Frank Vickery ● Brookline, Mass.; Harvard Medical School, Boston, 1882; assistant in clinical medicine from 1884 to 1890, instructor in clinical medicine from 1890 to 1913 and instructor in medicine 1913-1914 at his alma mater; formerly on the staff of the Massachusetts General Hospital; member of the Association of American Physicians; aged 83; died, February 22, of bronchopneumonia.

Carleton Graves Crisler ● Cincinnati; University and Bellevue Hospital Medical College, New York, 1903; assistant professor of clinical surgery at the University of Cincinnati College of Medicine; fellow of the American College of Surgeons; aged 59; on the staffs of the Children's Hospital and the Christ Hospital, where he died, March 9, of cerebral hemorrhage.

Henry Clark Buswell ● Buffalo; Niagara University Medical Department, Buffalo, 1888; formerly associate professor of medicine at the University of Buffalo School of Medicine; consulting physician to the Millard Fillmore Hospital, Deaconess Hospital and St. Mary's Hospital; aged 78; died, March 4, in the Strong Memorial Hospital, Rochester, N. Y., of pneumonia.

Earle Charlton Reynolds ● Passaic, N. J.; Cornell University Medical College, New York, 1910; fellow of the American College of Surgeons; served during the World War; aged 53; on the staffs of St. Joseph's Hospital, Paterson, and the Passaic General Hospital, where he died, February 19, of coronary occlusion.

Elmer Walter Powers, Westfield, N. Y.; University of Vermont College of Medicine, Burlington, 1899; member of the Medical Society of the State of New York; past president of the Chautauqua County Medical Society; served as school physician and health officer for many years; aged 69; died in February.

Frank Edwin Ayers, Celina, Ohio; Starling Medical College, Columbus, 1897; member of the Ohio State Medical Association; secretary of the Mercer County Medical Society; for many years county health officer; served during the World War; aged 63; died, February 23, of coronary thrombosis.

Daniel M. Kelly, Baraboo, Wis.; Rush Medical College, Chicago, 1892; member of the State Medical Society of Wisconsin; at one time mayor; for many years county physician; on the staff of St. Mary's Ringling Hospital; aged 75; died, February 27, of cerebral arteriosclerosis.

William Evelyn Hopkins, Los Angeles; University of Virginia Department of Medicine, Charlottesville, 1879; University of the City of New York Medical Department, 1880; member of the American Academy of Ophthalmology and Otolaryngology; aged 81; died, February 5.

William Monroe White ● Lieutenant Colonel, M. C., U. S. Army, Brackettville, Texas; Atlanta College of Physicians and Surgeons, 1903; served during the World War; entered the medical corps of the regular army in 1920; aged 61; died, January 10, of acute myocarditis.

Fred Hartzell Martz ● Johnstown, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1920; on the staff of the Lee Homeopathic Hospital; aged 43; died, February 22, in the Shadyside Hospital, Pittsburgh, of cerebral embolus and sarcoma of the right antrum.

John Alexander McKay, Shelton, Wash.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; Manitoba Medical College, Winnipeg, Man., Canada, 1914; aged 70; died, February 19, of cerebral hemorrhage.

John William Kosler Jr. ● Hammondsport, N. Y.; University of Maryland School of Medicine, Baltimore, 1906; for many years health officer of the village of Hammondsport and the town of Urbana; aged 60; died, February 8, of coronary thrombosis.

William Eugene Mowery ● Salina, Kan.; University Medical College of Kansas City, Mo., 1909; president of the Mowery Clinic; on the staffs of the Asbury Hospital and St. John's Hospital; aged 55; died, March 6, in Orlando, Fla., of coronary disease.

Eugene Edward Bauer, Owego, N. Y.; University of Buffalo School of Medicine, 1897; member of the Medical Society of the State of New York; for many years health officer; aged 69; died, February 25, of coronary occlusion and arteriosclerosis.

James Hoyt Huckins, Long Beach, Calif.; Drake University College of Medicine, Des Moines, Iowa, 1909; on the staffs of the Seaside Hospital, St. Mary's Hospital and the Community Hospital; aged 51; died, February 16, of heart disease.

William Joseph Scruggs, Camden, N. J.; Jefferson Medical College of Philadelphia, 1925; member of the Medical Society of New Jersey; aged 41; died, February 19, in the Cooper Hospital, Camden, of essential hypertension.

William Wallace Allred, Collins, Miss.; Memphis (Tenn.) Hospital Medical College, 1911; served during the World War; aged 58; died, March 4, in a hospital at Hattiesburg of coronary occlusion, periostitis and cirrhosis of the liver.

George Elmore Campbell ● Pasadena, Calif.; University of Minnesota Medical School, Minneapolis, 1895; on the staffs of the Huntington Memorial Hospital and St. Luke's Hospital; aged 72; died, February 14, of coronary thrombosis.

Daniel Austin Lobo, Philadelphia; Medico-Chirurgical College of Philadelphia, 1907; member of the Medical Society of the State of Pennsylvania; aged 57; on the staff of the Episcopal Hospital, where he died, February 16, of meningitis.

Vincent Gino, Chicago; Regia Università degli Studi di Palermo Facoltà di Medicina e Chirurgia, Italy, 1902; served during the World War; on the staff of the University Hospital; aged 63; died, March 4, of coronary thrombosis.

Barton Huxley Wherritt, Salt Lake City; University of Pennsylvania School of Medicine, Philadelphia, 1930; member of the Utah State Medical Association; aged 33; died, February 5, of injuries received in an automobile accident.

Augustus Thompson Marshall ● Randolph, Vt.; Dartmouth Medical School, Hanover, N. H., 1901; on the staff of the Gifford Memorial Hospital; aged 63; died, February 19, in a hospital at Boston of cerebral hemorrhage.

Charles Lytle Shultz, Brookline, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1910; member of the Medical Society of the State of Pennsylvania; aged 68; died, February 17, of chronic myocarditis.

William D. Danner, Spring Grove, Pa., Hahnemann Medical College and Hospital of Philadelphia, 1906; member of the Medical Society of the State of Pennsylvania; aged 57; died, February 24, of coronary embolism.

Charles Gilbert Percival, Cold Spring, N. Y.; College of Physicians and Surgeons, Boston, 1902; served during the World War; aged 67; died, February 29, of acute dilatation of the heart and chronic myocarditis.

Arthur Chalmers Wilkes, Newark, N. J.; New York Homeopathic Medical College and Hospital, New York, 1903; member of the Medical Society of New Jersey; aged 59; died, February 2, of carcinomatosis.

Oliver B. Jones Jr., Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1886; aged 75; died, February 19, in the Chestnut Hill Hospital of bronchopneumonia and myocarditis.

Joseph H. Hall, Plattsmouth, Neb.; Rush Medical College, Chicago, 1878; Bellevue Hospital Medical College, New York, 1882; formerly county physician; aged 86; died, February 28, of carcinoma of the stomach.

George R. De Laureal, Broussard, La.; Pulte Medical College, Cincinnati, 1891; member of the Louisiana State Medical Society; aged 70; died, March 4, of cerebral hemorrhage and coronary thrombosis.

George Clarence Swope, Mildred, Pa.; Southern Homeopathic Medical College, Baltimore, 1901; member of the Medical Society of the State of Pennsylvania; aged 64; died, February 1, of cerebral hemorrhage.

George W. Lott, Westboro, Mo.; State University of Iowa College of Medicine, Iowa City, 1889; member of the Missouri State Medical Association; aged 81; died, February 10, of coronary thrombosis.

David Porter Richardson, Henderson, Texas; Bellevue Hospital Medical College, New York, 1886; member of the State Medical Association of Texas; aged 89; died, February 19, of coronary thrombosis.

Russell Cleveland Lichtenfels, Pitcairn, Pa.; University of Pittsburgh School of Medicine, 1912; served during the World War; aged 50; died, March 9, in Miami, Fla., of coronary thrombosis.

David Taggart, Frackville, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1879; member of the Medical Society of the State of Pennsylvania; aged 83; died, February 28.

Clarence Philip Holoffe ● West Frankfort, Ill.; University of Illinois College of Medicine, Chicago, 1935; aged 28; died, March 10, in the Barnes Hospital, St. Louis, of acute myocarditis.

George Walton Greene, Auburn, N. Y.; University of the City of New York Medical Department, 1887; aged 77; died, February 14, of bronchopneumonia following a fracture of the femur.

Joseph Henry Hart Kelley, Boston; Tufts College Medical School, Boston, 1898; member of the Massachusetts Medical Society; aged 62; died, February 18, of carcinoma of the tongue.

Henri F. Bartens, Santa Monica, Calif.; Homeopathic Medical College of Missouri, St. Louis, 1876; St. Louis College of Physicians and Surgeons, 1892; aged 90; died, January 19.

Wallace Dale Miller ● Dayton, Ohio; Ohio State University College of Medicine, Columbus, 1933; aged 36; died, February 21, of injuries received in an automobile accident.

Robert Greiderer, St. Louis; Leopold-Franzens Universität Medizinische Fakultät, Innsbruck, Austria, 1911; aged 53; died, March 6, in the City Hospital of hypostatic pneumonia.

Marion Nathaniel Wood, Florence S. C.; University of Georgia Medical Department, Augusta, 1891; aged 74; died, February 25, of hypertension and cerebral hemorrhage.

Julian Addison Pollard, Springfield, Mass.; University of Vermont College of Medicine, Burlington, 1882; aged 87; died, February 20, of arteriosclerosis and diabetes mellitus.

George M. Joseph, Morgantown, W. Va.; Eclectic Medical Institute, Cincinnati, 1890; aged 72; died, February 3, in the St. Francis Hospital, Pittsburgh, of cerebral hemorrhage.

Orla E. Kuhn, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1904; on the staff of the Garfield Park Community Hospital; aged 61; died, March 8.

Andrew Barnard Cushman ● South Dartmouth, Mass.; University of Vermont College of Medicine, Burlington, 1886; aged 83; died, February 13, of coronary thrombosis.

Schuyler A. Barber, Porterville, Calif.; Cooper Medical College, San Francisco, 1899; aged 70; was found dead, February 14, of coronary disease and cirrhosis of the liver.

Otto L. Bergner, Milwaukee; Milwaukee Medical College, 1908; member of the State Medical Society of Wisconsin; aged 57; died, February 14, of carcinoma of the stomach.

Maxwell Wallace, Emerson, Man., Canada; Manitoba Medical College, Winnipeg, 1903; aged 69; died, February 26, in Halloch, Minn., of cerebral hemorrhage and uremia.

Stephen Cleary, San Francisco; University of California Medical Department, San Francisco, 1894; aged 79; died, February 16, in St. Mary's Hospital of pneumonia.

Ellen Louisa Keith, Grafton, Mass.; Boston University School of Medicine, 1888; aged 88; died, February 5, in Westboro of cerebral hemorrhage and arteriosclerosis.

George Morehouse Purves, Philadelphia; University of Pennsylvania Department of Medicine, Philadelphia, 1895; aged 65; died, February 21, of coronary thrombosis.

Frederick H. Thaxton, Elkview, W. Va.; Kentucky School of Medicine, Louisville, 1907; aged 59; died, February 22, in a hospital at Charleston of cerebral hemorrhage.

James H. Montgomery, Gainesville, Fla.; Medico-Chirurgical College of Philadelphia, 1898; aged 64; died, February 16, in the Alachua County Hospital

Bernard E. Murphy, Los Angeles; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; aged 60; died, January 18.

Harry Francis Tye, Philadelphia; Temple University School of Medicine, Philadelphia, 1924; aged 40; died, February 26, in the Stetson Hospital of myocarditis.

Henry F. Wilton, Nocona, Texas; Missouri Medical College, St. Louis, 1885; aged 82; died, February 12, at a hospital in Fort Worth of cerebral hemorrhage.

T. Selden Stewart, Buffalo; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1883; aged 88; died, February 23, of bronchopneumonia.

Carl Herman Lehnera, Reno, Nev.; Cooper Medical College, San Francisco, 1903; aged 61; died, February 25, of arteriosclerosis and heart disease.

Daniel Patrick Doyle, Jamaica, N. Y.; University of the City of New York Medical Department, 1890; aged 74; died, February 9, of chronic nephritis.

Frank A. Martin, Bowdon, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1886; aged 75; died, February 27, in Atlanta of myocarditis.

William A. Jones, Quincy, Ill.; Missouri Medical College, St. Louis, 1880; aged 82; died, February 10, in Middletown, Ohio, of coronary sclerosis.

Joseph M. Miller, Charles Town, W. Va.; College of Physicians and Suregons, Baltimore, 1877; aged 86; died, February 28, of senility.

Samuel Schulhofer, Santa Monica, Calif.; Columbia University College of Physicians and Surgeons, New York, 1901; aged 61; died, January 1.

James Franklin Rudy, Jenera, Ohio; Starling Medical College, Columbus, 1892; aged 77; died, February 18, of pneumonia and heart disease.

Thomas White Peden, Van Vleet, Miss.; Memphis (Tenn.) Hospital Medical College, 1901; aged 67; died, February 22, of coronary thrombosis.

John Campbell Mason ● Herminie, Pa.; Chicago College of Medicine and Surgery, 1913; aged 66; died, February 18, of coronary occlusion.

Thomas Joseph Dowd ● Ticonderoga, N. Y.; Albany (N. Y.) Medical College, 1904; aged 58; died, February 19, of cardiorenal disease.

Alfred Creigh Stevenson, Oakdale, Pa.; Jefferson Medical College of Philadelphia, 1871; aged 93; died, February 23, of bronchopneumonia.

John J. Sledge, Burns, Tenn.; University of Tennessee Medical Department, Nashville, 1880; aged 78; died, February 29, in Nashville.

Daniel E. Cullers, Stella, Mo.; College of Physicians and Surgeons, Keokuk, Iowa, 1896; aged 71; died, January 31, of angina pectoris.

Charles Asahel Gould, Braintree, Mass.; Harvard Medical School, Boston, 1881; aged 82; died, February 21, of carcinoma of the prostate.

William P. Washington, Rayville, La.; Medical College of Alabama, Mobile, 1891; aged 81; died, February 28, of chronic myocarditis.

Cornelius R. Collins, Omaha; John A. Creighton Medical College, Omaha, 1900; aged 67; died, February 22, of lobar pneumonia.

Raymond D. Cashatt, Oakland, Calif.; Willamette University Medical Department, Salem, Ore., 1904; aged 62; died, January 6.

Robert Ayres, Pittsburgh; University of Pittsburgh School of Medicine, 1912; aged 51; died, January 16, of coronary occlusion.

Marius C. Sorensen, Huron, S. D.; National Medical University, Chicago, 1901; aged 72; died, February 27, of pneumonia.

George Richard Luke, Ashburn, Ga.; Atlanta School of Medicine, 1906; aged 57; died, February 19, of coronary thrombosis.

Otto Fuchs, New York; Long Island College Hospital, Brooklyn, 1899; aged 73; died, January 28, of coronary sclerosis.

Louis Levin, Los Angeles; Temple University School of Medicine, Philadelphia, 1910; aged 53; died, January 23.

Correspondence

CHEMICAL TESTS FOR INTOXICATION

To the Editor:—The criticism of certain chemical tests for intoxication made in THE JOURNAL, March 23, page 1098, by Dr. Chauncey D. Leake and his associates is somewhat vague as to just how their experiments were conducted.

The sample of necropsy blood may have been contaminated with embalming fluid, although a test for formaldehyde would have settled this point. I have found that even the cap of an embalming fluid bottle can contaminate a small sample of blood stored in such a bottle.

That a trace of endogenous "alcohol" is present in the blood and tissues of a nondrinking person has been repeatedly demonstrated during the past eighty years. In 1935 (*Am. J. Physiol.* **112**:374 [June] 1935) Dr. Anna L. Goss and I published experiments indicating that even this trace of volatile reducing substance—usually less than 1 mg. per hundred cubic centimeters—is mostly not preformed alcohol. This trace of "normal alcohol" is too small to cause a significant error in the usual chemical tests for intoxication, as has been demonstrated by numerous control studies carried out by the originators of the various chemical tests for alcohol and by hundreds of workers all over the world in using these tests.

The figures for endogenous "alcohol" reported by Dr. Leake and his associates (from 50 to 200 mg. per hundred cubic centimeters!) are amazing, and other workers should confirm these observations.

The blood lactic acid hypothesis proposed by the University of California pharmacologists certainly does not add to the credibility of their claims. Under the conditions employed lactic acid is practically nonvolatile, as could be learned by consulting their colleagues in the chemistry department (Allen's Commercial Organic Analysis, ed. 5, Philadelphia, Blakiston Company **1**:776, 1924).

Even if these claims are confirmed, they have little application to living subjects.

Perhaps I should welcome an attack on Dr. Heise's method, since his apparatus is the chief competitor to my "drunkometer" in police laboratories, but criticism should be reasonable and supported by ample evidence.

R. N. HARGER, PH.D., Indianapolis.
Professor of Biochemistry and Toxicology,
Indiana University School of Medicine.

IS SULFANILAMIDE DANGEROUS TO BABIES?

To the Editor:—Unjustified clinical analogies drawn from excellent experimental work in animals may be unfortunate. For instance, an editorial comment in THE JOURNAL, March 30, page 1271, summarizes the article "The Placental Transmission of Sulfanilamide and Its Effects on the Fetus and Newborn" by Speert (*Bull. Johns Hopkins Hosp.* **66**:139 [March] 1940). This experimental work is adequately controlled and clearly demonstrates the toxic effect on the fetus and newborn rat from tremendous doses of sulfanilamide administered during pregnancy. The conclusion "until further observations have been made of the effects of sulfanilamide upon the human fetus, the drug should be administered with extreme caution during pregnancy" is an assumed human analogy not supported by data presented. The dose of 1 Gm. of sulfanilamide per kilogram of body weight administered to animals throughout pregnancy is not comparable to the average clinical dose taken by human beings. On the basis of the experimental quantities, an analogous dose for an average woman weighing 50 Kg. would approximate 750 grains (50 Gm.) of sulfanilamide daily throughout pregnancy, or the maintenance of a mean blood level of 19.7 mg. per hundred cubic centimeters and a standard deviation of ± 8.1. Speert recognizes that toxic doses in rats are not comparable to therapeutic doses in women. We heartily endorse his statement: "It is hazardous to carry over to one species conclusions from experimental observations made upon another. Moreover, in the present experiments the blood sulfanilamide levels were much higher than usually reached in the treatment of human patients. Also the administration of the drug was continued throughout gestation, in contrast to the relatively shorter periods of therapy that are usually required clinically. No claims can therefore be made for any clinical application of these experimental findings."

Our clinical studies fail to show any harmful effects on the baby. We reported (Sulfanilamide Excretion in Human Breast Milk and the Effect on Breast-Fed Babies, THE JOURNAL, Oct. 15, 1938, p. 1456) no untoward effects on breast-fed babies when the mothers were given 60 grains (4 Gm.) of sulfanilamide daily during the first eight postpartum days. Likewise, administration of from 40 to 60 grains (2.6 to 4 Gm.) of sulfanilamide during labor had no effect on the babies. In an unreported series of eleven cases of pyelitis during the midperiod of pregnancy, doses sufficient to maintain blood sulfanilamide levels of from 7 to 10 mg. per hundred cubic centimeters were administered for from eight to twelve days. Observation of their babies has not disclosed any evidence that therapeutic doses of sulfanilamide taken by the mother affects the baby unfavorably.

J. P. PRATT, M.D.
H. L. STEWART JR., M.D.
Detroit.

THE SIMS SPECULUM

To the Editor:—In the March 9 issue of THE JOURNAL, page 912, the question of retrodisplacement of the uterus following trauma was considered. I think that an experience of Dr. J. Marion Sims is of great interest and would like to call attention to it. On page 15 in Clinical Notes on Uterine Surgery, written by Dr. Sims and published by William Wood & Co. in 1886, appears the following: "In December 1845, a lady riding a pony in Montgomery, Alabama, fell striking her pelvis and suffering contusions of the back and rectal and vesical tenesmus. The uterus was found in complete retroversion, which was replaced with the patient in knee-chest position, by manual pressure and accidental introduction of air. On deliberation of a patient with a vesicovaginal fistula and of the vagina which ballooned with the introduction of air, the Sims Speculum was invented."

THOMAS J. PARKS, M.D., New York.

BRONCHOBILIARY FISTULA

To the Editor:—In Tonics and Sedatives in THE JOURNAL, Dec. 9, 1939, you carry the following newspaper report, which was sent to you by a number of different correspondents:

> PRYOR (Okla.) Oct. 31. (U. P.).—Mrs. Homer Stout, 46-year-old farm woman whose case medical scientists had watched as the latest and perhaps the most thorough test yet of refrigeration treatment of cancer, died late today of a second affliction.
>
> Dr. Van Delph Herrington announced after an autopsy that death resulted from a gallstone block of bile ducts that forced the fluid into Mrs. Stout's lungs and suffocated her.

The fact that this item was picked up in so many different quarters and sent in to Tonics and Sedatives indicates, I presume, a widespread incredulity as to anatomic background for the reported diagnosis.

In this connection, however, it may be well to remember that the condition of bronchobiliary fistula is not by any means unknown. It appears to be true that most of these fistulas are secondary to "hydatid infestation of the liver with intraduct

rupture," as stated by Miller, of Sydney, Australia. This same author, however, in the *British Journal of Surgery* (27:425 [Oct.] 1939) reports a bronchobiliary fistula following traumatic stenosis of the common duct. The patient in this instance, following cholecystectomy, suffered intense pain and intermittent jaundice, which later became complete. Five months afterward he suddenly coughed up a large quantity of bile and thereafter expectorated 60 ounces (1,800 cc.) of bile in twenty-four hours, apparently with relief of the jaundice and pain. It is very easy to imagine that if this patient had been comatose under cryotherapy he would have aspirated a portion of this huge quantity of bile and thus suffocated, just as the unfortunate patient of the newspaper item was said to have done.

THOMAS C. MCVEAGH, M.D., Honolulu, T. H.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

CHRONIC UNDULANT FEVER

To the Editor:—A white woman aged 30, single, complains of fever of three years' duration. The mother died of rheumatic heart disease at about 50. The past history is irrelevant except for the usual childhood diseases. About three years ago she felt run down and had a low grade fever and mild toothache. She was operated on for pyorrhea alveolaris but the fever following operation did not recede and there was a stormy postoperative course characterized by fever of 101 to 103 F. A blood test for undulant fever as well as a cutaneous test was said to have been positive at this time and she was later treated with Huddleson's antigen, autohemolysis and typhoid vaccine intravenously without demonstrable results as far as the persistence of the fever was concerned. She has since been trying to get about her duties but has a fever almost every day ranging from 99 to 100 F. She feels despondent at times and has thought of suicide. She is easily fatigued and at times is unable to talk correctly when tired. A recent blood test is positive for undulant fever at a titer of 1:40. The cutaneous test is questionable. Physical examination is essentially negative and the chest roentgenogram is not remarkable. The blood count and hemoglobin are normal. The agglutination titer for typhoid is 1:640 but this was interpreted as the result of the injections of typhoid vaccine intravenously about two and one-half years ago. 1. Does undulant fever persist for this length of time? 2. Is a positive cutaneous test for undulant fever in the absence of a positive blood test (a test with a titer below 1:80) with clinical symptoms sufficient for a diagnosis of this disease? 3. Is chronic undulant fever ever mental changes and changes in personality frequent? 4. Is there any treatment for a case of this kind? 5. What is the prognosis and outlook for chronic cases of undulant fever? Any references you can give on this case will be greatly appreciated.

M. C. Davis, M.D., Portland, Ore.

ANSWER.—1. The chronic form of brucellosis (undulant fever) often persists for several years.

2. A positive allergic cutaneous test in the absence of a positive agglutination test may or may not have diagnostic significance. While most patients with the more severe acute form of brucellosis will exhibit both positive agglutination tests in high titer and positive intradermal reactions, persons suffering from chronic brucellosis often have repeatedly negative agglutination tests and positive cutaneous tests. The chief sources of error lie in the fact that either or both tests may be positive in exposed individuals with no history of an illness compatible with brucellosis. Furthermore, the cutaneous hypersensitiveness, once acquired, often persists for many years. Therefore it must be emphasized that a positive cutaneous test does not mean that the symptoms from which the patient is suffering at the time of a positive cutaneous test are necessarily due to brucellosis. It is hazardous to base a diagnosis of brucellosis solely on the fact that a cutaneous test is positive.

3. Psychic disturbances and changes in personality are frequently observed in cases of chronic brucellosis. Almost all students of chronic brucellosis have emphasized the almost universal prominence of symptoms which relate to the central nervous system. In addition to the occasional regional invasion of the meninges, brain and spinal cord by Brucella, there is evidence that the endotoxin of Brucella organisms circulating in the blood has a toxic action on the central nervous system. These observations led Alice Evans (THE JOURNAL, Sept. 1, 1934, p. 665) to state: "These facts challenge the right of a physician to make a diagnosis of neurasthenia—a diagnosis regarded as dishonorable by the patient, and also by his family, his employer and his friends—without considering, among other possibilities, the possibility of chronic brucellosis."

4. Brucella melitensis (abortus-suis) vaccine N. N. R., brucellin (Huddleson) and the production of artificial fever by injections of typhoid-paratyphoid vaccine or preferably by physical means apparently yield the best results in the treatment of brucellosis. There is little evidence that sulfanilamide therapy produces any lasting benefit.

5. The outlook in cases of chronic brucellosis has improved considerably during the past few years. With judicious supportive and specific therapy most patients recover or improve greatly within a few weeks or months after the institution of treatment.

The following references are suggested:

Simpson, W. M.: Undulant Fever (Brucellosis) with Reference to 148 Cases Encountered In and About Dayton, Ohio, *J. Indiana M. A.* 27:564 (Dec.) 1934.
DeJong, R. N.: Central Nervous System Involvement in Undulant Fever, with Report of a Case and a Survey of the Literature, *J. Nerv. & Ment. Dis.* 83:430 (April) 1936.
Calder, R. M.: Chronic Brucellosis, *South. M. J.* 32:451 (May) 1939.
Evans, Alice C.: Chronic Brucellosis, THE JOURNAL, Sept. 1, 1934, p. 665.
Evans, Alice C.: Studies on Chronic Brucellosis: I. Introduction, *Pub. Health Rep.* 52:1072 (Aug. 6) 1937; II. Description of Technics for Specific Tests, ibid. 52:1419 (Oct. 8) 1937.
Poston, M. A.: Studies on Chronic Brucellosis. III. Methods Used in Obtaining Cultures, *Pub. Health Rep.* 53:1 (Jan. 7) 1938.
Angle, F. E.: Treatment of Acute and Chronic Brucellosis (Undulant Fever), THE JOURNAL, Sept. 21, 1935, p. 939.
Evans, Alice C.: Difficulties in the Diagnosis of Chronic Brucellosis, *Am. J. Trop. Med.* 19:319 (July) 1939.
Ervin, C. E., and Hunt, H. F.: The Diagnosis and Treatment of Undulant Fever, THE JOURNAL, Dec. 11, 1937, p. 1966.
Prickman, L. E.; Bennett, R. L., and Krusen, F. H.: Treatment of Brucellosis by Artificially Induced Hyperpyrexia, *Proc. Staff Meet., Mayo Clin.* 13:321 (May 25) 1938.

TREATMENT AND PROGNOSIS OF SPONGIOBLASTOMA MULTIFORME

To the Editor:—A patient of 60 was operated on for a brain tumor involving the right frontal lobe. Almost two thirds of the inferior portion of the frontal lobe was removed, with a subsequent paralysis of the left side of the face, and the left arm, and weakness of the left leg. The tumor was incompletely removed. The pathologic diagnosis was spongioblastoma multiforme. Is subsequent roentgen or radium treatment advisable? If so, how soon after operation should it be started and also to what dosage? Is this type of tumor amenable to such treatment? What is the prognosis of such a case as to probable life expectancy? If there is regrowth causing pressure symptoms, is operative intervention advisable?

M.D., Pennsylvania.

ANSWER.—Spongioblastoma multiforme, more commonly designated glioblastoma multiforme, is the commonest primary tumor of the cerebrum, and it is the most malignant and invasive as well. The degree of malignancy and its radiosensitivity vary with the cell type, but because of its malignant nature and because in most cases, like that in question, the tumor is incompletely removed, subsequent roentgen or radium therapy is usually employed. Such treatment should be started as soon after the operation as the patient becomes ambulatory and able to be taken to the treatment room. Usually this is in a week to ten days, at which time the scalp is healed. Any delay is inadvisable.

There is a wide diversity of opinion as to the efficacy of roentgen and radium treatment for glioblastoma multiforme. Most authorities advise its use, but even so these authorities are in most instances none too hopeful over the results. Cushing used it and advised others to do so, but he stated that there was usually a recurrence in from six to eighteen months in spite of wide operative removal or subsequent roentgen treatment. He advised reoperation on recurrence of the tumor if the patient's condition warranted it, but he stated that heavy x-ray dosage gave little or no relief in cases of advanced regrowth. Davis, in a comparison of the survival period between patients given roentgen therapy and patients not thus treated, showed that actually there was little difference. Many factors affect the survival period: location of the tumor, its cell type, the age and general condition of the patient, and the effects of operation (wide removal, biopsy or decompression).

There is no standard of dosage or technic in the use of either x-rays or radium. There is no particular choice between the two. In using x-rays, high voltage therapy should be employed. A single full dose is usually approximately from 800 to 1,000 roentgens or it may be as low as from 400 to 500 roentgens. From 800 to 1,000 roentgens may be given once a week at one sitting, repeated for from four to eight weeks; or 500 roentgens may be given daily for four times and repeated in from six to eight weeks. After from six to eight months, another series of

four treatments is given. In using radium in a series of fourteen patients, Davis used two ports and gave 2,000 mg. hours each day until a total of 80,000 mg. hours of radium through each of the two ports had been given. That is, each patient received 160,000 mg. hours of radium.

The eventual prognosis is in any case poor, and the probable life expectancy under any conditions is not more than thirty months.

SULFAPYRIDINE CONTRAINDICATED IN PROPHYLAXIS OF PNEUMONIA

To the Editor:—Many physicians are prescribing sulfapyridine as a prophylaxis against pneumonia. A patient develops a cold and high fever and some physicians are prescribing sulfapyridine immediately. Is this good practice when one does not or can not get a check on the blood or urine? Is it safe to do that on almost any patient for twenty-four or forty-eight hours?

Clifton F. West, M.D., Kinston, N. C.

ANSWER.—It is unfortunate if physicians are prescribing sulfapyridine in the prophylaxis of pneumonia, because such a practice is unwise and may be dangerous for the patient. Sulfapyridine should be prescribed only when signs and symptoms of an actual involvement of the bronchi and lungs exist. This means that if the patient has a cold with fever, or influenza, sulfapyridine should not be administered unless definite physical signs of a bronchitis or of an early pneumonia are present. If signs of bronchitis are present, one does not need to wait until further signs develop before using the drug. Obviously it is always a good practice, if sputum can be obtained, to attempt to culture or type the sputum for the presence of pneumococci or other organisms that would be susceptible to sulfapyridine therapy. While sulfapyridine now constitutes the sheet anchor in the treatment of acute infectious pulmonary disease, it should be used only when disease is present.

Acute hemolytic anemia, acute leukopenia with neutropenia, drug fever, drug rashes, hematuria and anuria have been reported as occurring within the first forty-eight hours of the therapeutic use of sulfapyridine. Hence, unless the signs and symptoms of a definite pulmonary involvement are present, the drug should not be used in the prophylaxis of pneumonia.

PREVENTION AND TREATMENT OF LOCAL ANESTHETIC REACTIONS

To the Editor:—It has recently been called to my attention that to combat the effects of procaine hydrochloride solution when injected into the blood stream there is now a preparation being advocated which is essentially an intravenous barbiturate solution. I have been of the opinion, up until this time, that ephedrine in from 2 to 5 cc. quantities was a good preparation with which to combat collapse from local anesthesia. Please advise me as to the correct preparation and the situations in which they should be used.

L. F. Valentine, M.D., North Platte, Neb.

ANSWER.—Procaine hydrochloride (novocain) toxicity, whether from accidental intravenous injection or from too rapid absorption, manifests itself in either of two fairly well defined reactions. One is a condition varying in degree from faintness to severe collapse, the second from mild excitement to convulsions.

The treatment resolves itself into prophylactic and combative efforts. As prophylaxis against procaine reaction may be mentioned the use of epinephrine-like vasoconstrictors in the procaine solution, a slow rate of injection, low drug concentration and the use of barbiturates. The barbiturates when given in small doses by mouth well in advance of the injection depress the cerebral cortex and are of some value in preventing the minor reactions, which are presumably due to the fear of the injection and the impending operation. It is doubtful whether the barbiturates when given in the small doses which will accomplish this result will prevent the convulsive effect of procaine.

When collapse or convulsion occurs, the important thing to combat is the resultant anoxia by means of artificial respiration with or without oxygen. Should the reaction be accompanied by a persistent convulsion, this demands additional treatment. The value of a barbital derivative given intravenously lies in its anticonvulsant properties. The barbiturates should be administered symptomatically; that is, by fractional doses until the convulsion is controlled. For this purpose one of the shorter acting barbiturates, such as pentothal sodium, has been found best. Barbiturates will be of some value if convulsions exist, but artificial respiration is of the utmost necessity and this should be given first without delay and maintained until adequate respiration is reestablished.

Analeptics such as nikethamide [pronounced nik-eth-amide] (coramine) in the face of an already damaged respiratory center or in impending respiratory paralysis from anoxemia have not been found to exert a stimulant action but, on the contrary, may be severely depressant.

BANTI'S SYNDROME

To the Editor:—At a recent staff meeting Banti's disease was mentioned. I was under the impression that recent research had brought out the fact that there was only a Banti's syndrome but not a disease or a distinct clinical entity. Please discuss the present status of this syndrome or disease.

Robert Augenfeld, M.D., Yonkers, N. Y.

ANSWER.—At present the term "Banti's syndrome" appears to be preferable to "disease," as the group of symptoms may be the result of a number of mechanisms. The changes in the spleen and liver are not specific for this one condition but are characteristic of other types of cirrhosis of the liver with splenomegaly. No specific causation has been described, and the thrombophlebitis of the splenic vein noted in some of the cases is not a special type. The progressive anemia is not unlike that in other types of cirrhosis of the liver, being microcytic when there is acute or chronic hemorrhage and macrocytic when the liver lesion is marked but otherwise not complicated. The term "Banti's syndrome," however, is useful to classify certain cases of splenomegaly, progressive cirrhosis and anemia, with the terminal symptoms which accompany hepatic cirrhosis, often, but not always, marked by three more or less indefinite stages. Unfortunately, however, there is no clearcut diagnostic feature which typifies this syndrome, and many examples of other diseases are classified under this heading.

AUTOHEMOTHERAPY

To the Editor:—What are the indications for autohemotherapy? What are the dangers, if any, associated with its use and what is the rationale of treatment? I have been using this treatment for some five or six years in a varied number of infections, particularly pelvic infections in women, ivy poisoning which did not respond to ordinary methods of treatment, pernicious vomiting of pregnancy and various dermatoses, most of which were allergic in character. My results have been satisfactory in all cases except the cutaneous lesions, not including ivy. I should like to be able to give an intelligent explanation of why this method of treatment is successful in most cases and not successful in others.

Henry B. Hibbs, M.D., Dubuque, Iowa.

ANSWER.—Autohemotherapy seems to have had its origin in the Hahnemann school under the egis of "simila similibus curantur." As early as 1828 mention of this type of therapy appears in the American literature. The relatively recent foreign literature abounds with references to the subject, but little attention has been paid to it in this country. The indications for its use are not clearly drawn, as many of the proponents have been guided by enthusiasm rather than by carefully controlled observation. One author gives the indication as "any chronic complaint whether it be in the head, the stomach, or the feet, the joints, or the skin; in short, any region in which blood circulates." Fortunately, more recent and more critical work has limited the scope of its application and promises to bring some sort of order into the chaotic situation. It seems to relieve a fair number of patients suffering from ivy poisoning. Its success in the treatment of psoriasis, eczema and other dermatologic conditions is highly problematic. Recent work would indicate some beneficial effect in the vomiting of pregnancy, although the evidence is rather scanty. Most gynecologists have failed to be impressed by its use in acute pelvic infections.

Its mode of action is not understood. It has been attributed to protein shock, to an increase in the bactericidal power of the blood, to an increase in the fixation power of the reticuloendothelial system and to a number of other intangible factors. The bulk of opinion today would argue that if it is effective at all it operates as an obscure desensitizing mechanism.

No dangers accompany its use except the danger of infection that attends any intramuscular injection.

EFFECTS OF HORSEHAIR IN CIGARETS

To the Editor:—I have been asked about putting horsehair in cigarets to stop boys from smoking. One of our school coaches did this to the group of football boys and one of them got quite ill. Will you kindly advise me of the cause, reaction, danger and treatment, as I am expecting to be called on to care for some of these as treated.

E. H. Kerr, M.D., Alma, Neb.

ANSWER.—The insertion of horsehair in cigarets to stop boys from smoking, or as a practical joke, has been verbally reported in widely scattered sections of the country, but no scientific study of the practice has yet been published. In view of the high cysteine content of hair, the production of sulfur compounds in the incomplete oxidations and distillation of smoking might be suspected to be a factor in the reactions produced. However, purified and defatted hair seems much less noxious than does fresh unwashed hair, suggesting that acrolein and other products of the breakdown of fatty secretion on the hair may

be responsible for the noxious effect. The heating and combustion of any animal tissue, especially incomplete oxidations, give rise to nauseating volatile compounds which may be especially toxic to sensitive individuals. In novices the smoke of tobacco or even of the various tobacco substitutes used by the young to simulate it may induce emesis and vasomotor collapse. This is usually a self-limited condition, with little danger involved, and reassurance may be sufficient treatment, although stimulation, sedation and elimination may be of value in specific instances.

TETANUS AFTER ANTITOXIN

To the Editor:—Recently I had the following case: A fish-store man aged 44 almost chopped his thumb off at the base with a large fish cleaver. It was a clean cut and there was profuse hemorrhage (close to a pint). Hemorrhage was controlled by suturing, and 1,000 units of tetanus antitoxin was given. There was 1,500 units of the tetanus antitoxin in a syringe but a drop or two was wasted, owing to movement by the patient. Hot dressings were applied to the hand for a couple of days. The wound healed promptly. Eleven days later the man developed tetanus and died a week later. 1. How frequently does tetanus develop in cuts of this type, especially after serum has been given? 2. This man frequently scratched and cut himself during his work. Is it conceivable that another preexisting lesion was the cause of the tetanus? 3. On the facts as given, was it negligent not to have given another injection?

Arnold L. Lieberman, M.D., Gary, Ind.

ANSWER.—1. An exact answer to this question cannot be made. All that can be said is that tetanus may develop after such cuts even if antitetanus serum is given, as in this case.

2. Yes. It is conceivable that the tetanus may have developed from the entrance of tetanus bacilli through some other lesion. The apparent incubation period—eleven days—corresponds well to the usual incubation period of tetanus, namely a few days to about two weeks.

3. The usual dose of tetanus antitoxin for preventive purposes is 1,500 units and consequently there can be no question of negligence in this case.

WAVELENGTHS OF FLUORESCENT LAMPS NOT INJURIOUS TO EYES

To the Editor:—I have been asked by a local business firm regarding the lighting of part of its factory. The installation is by lamps from the Hygrade Sylvania 100 Fluorescent lamps. Lamps consist of 40 watt blue white tubes. The tube number was T 12. Some of the employees have complained of their eyes since being under these lights, and the employer hesitates to add to his present installation if there are spectral elements that increase eye sensitivity. G. F. Harkness, M.D., Davenport, Iowa.

ANSWER.—The 40 watt blue white T 12 fluorescent lamps of the Hygrade Sylvania Corporation do not give any "special elements," that is, any special wavelengths of light which are injurious to the eyes. If employees complain when working under these lights, the fault is not in the wavelength or quality of the light given out by these lamps but in the way they are used. The two important features of lighting are the amount of light and the distribution of light. There is no excuse for insufficient light, and if the distribution is taken care of the results will be satisfactory. The wavelength is unimportant except in a case in which color matching is involved.

Without knowing some of the details, the kind of work done, the general surroundings in the workroom, the kind of light which was formerly used and the reason for changing, it is impossible to give a critical evaluation of the lighting installation.

HODGKIN'S DISEASE AND BRUCELLOSIS

To the Editor:—In Queries and Minor Notes in The Journal, March 16, page 1086, is a question entitled Hodgkin's Disease and Sulfanilamide. I should like to offer a possible explanation as to the unusual behavior of this patient with probable Hodgkin's disease after the administration of sulfanilamide. Pearse and Pastea (Pathology of Human Brucellosis, South. M. J. 33:1 [Jan.] 1939) reported four cases of "chronic brucellosis which presented a clinical and histologic picture strikingly similar to that of Hodgkin's disease." Their observations were commented on in The Journal, February 18, under Current Comment. It would apparently be premature to state that Brucella is the etiologic agent in Hodgkin's disease in spite of such significant observations. However, the possible relationship cannot be ignored. Does it not seem possible that the patient described had an infection with Brucella which simulated or actually caused a clinical and histologic picture of Hodgkin's disease and that the improvement following sulfanilamide is ascribable to the well established bacteriostatic effect of sulfanilamide on the Brucella organism? It might be of value if this patient should now be studied from the point of view of Brucella infection. In view of the tendency of the blood agglutination test to be negative in chronic brucellosis or positive only in a low titer, a cutaneous test with heat killed Brucella abortus vaccine and an opsonocytophagic test would be indicated. If possible, culture of the blood for Brucella using the technic of Pastea should also be undertaken as well as culture of an involved gland, if further excision of gland tissue is permitted. Harold J. Harris, M.D., Westport, N. Y.

Council on Medical Education and Hospitals

PENNSYLVANIA STATE BOARD OF EXAMINERS FOR REGISTRATION OF NURSES APPROVES ADDITIONAL HOSPITALS

In addition to the hospitals designated as approved by the State Board of Examiners for Registration of Nurses in Pennsylvania in THE JOURNAL, March 30, the board now announces full approval of the following hospitals:

Mercy Hospital	Altoona
Providence Hospital	Beaver Falls
St. Joseph's Hospital	Carbondale
Clearfield Hospital	Clearfield
Mercy Hospital	Johnstown
Good Samaritan Hospital	Lebanon
Ohio Valley General Hospital	McKees Rocks
Meadville City Hospital	Meadville
Spencer Hospital	Meadville
Henry Clay Frick Memorial Hospital	Mount Pleasant
Beaver Valley General Hospital	New Brighton
Mercy Hospital	Scranton
St. Mary's Mater Misericordia Hospital	Scranton
Wyoming Valley Homeopathic Hospital	Wilkes-Barre

Notice of the approval of these additional hospitals reached THE JOURNAL too late for publication in the Hospital Number.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 18-20. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARKANSAS: *Basic Science*, May 25. Sec., Mr. Louis E. Gelauer, 701 Main St., Little Rock. *Medical* (Regular). Little Rock, June 6-7. Sec., Dr. D. L. Owens, Harrison. *Medical* (Eclectic). Little Rock, June 6-7. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, July 15. *Written examination*, San Francisco, June 24-27. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

CONNECTICUT: *Basic Science*, New Haven, June 8. Sec., Dr. Esther B. Starks, 1439 Ogden St., Denver.

DELAWARE: *Examination*, Dover, July 9-11. *Reciprocity*, Dover, July 16. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT COLUMBIA: Washington, May 13-14. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

FLORIDA: *Basic Science*, De Land, May 25. Sec., Prof. John F. Conn, De Land. *Medical*, Tampa, June 17-18. Sec., Dr. William M. Rowlett, Box 796, Tampa.

GEORGIA: Atlanta, June. Joint Sec., Mr. R. C. Coleman, 111 State Capitol, Atlanta.

ILLINOIS: Chicago, June 25-27. Acting Superintendent of Registration, Mr. Lucien A. Yoe, Springfield.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

IOWA: Iowa City, June 4-6. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Kansas City, June 18-19. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. Seventh St., Kansas City.

KENTUCKY: Louisville, June 6-8. Sec., Dr. A. T. McCormack, 620 S. Third St., Louisville.

MARYLAND: *Medical*, Baltimore, June 18-21. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homeopathic*, Baltimore, June 18-19. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Ann Arbor and Detroit, June 12-14. Sec., Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MISSISSIPPI: Jackson, June. Asst. Sec., Dr. R. N. Whitfield, Jackson.

NEBRASKA: *Basic Science*, Omaha, May 7-8. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, 1009 State Capitol Bldg., Lincoln.

NEVADA: *Reciprocity with oral examination*, Carson City, May 6. Sec., Dr. Frederick M. Anderson, 215 North Carson St., Carson City.

NEW JERSEY: Trenton, June 18-19. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 24-27. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Building, Albany.

NORTH DAKOTA: Grand Forks, July 2-3. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: Columbus, June 3-6. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: *Basic Science*, Oklahoma City, May 9. *Medical*, Oklahoma City, June 3-6. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: *Medical*, Portland, June 18-20. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland. *Basic Science*, July 6. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia and Pittsburgh, July. Dir., Bureau of Professional Licensing, Dr. James A. Newpher, 358 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, June 25. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Rapid City, July 16-17. Dir., Medical Licensure, Dr. J. F. D. Cook, Pierre.

TENNESSEE: Knoxville, Memphis and Nashville, June 14-15. Sec., Dr. H. W. Qualls, 130 Madison Ave., Memphis.
TEXAS: San Antonio, June 17-19. Sec., Dr. T. J. Crowe, 918-20 Mercantile Bldg., Dallas.
VERMONT: Burlington, June 11-13. Sec., Dr. W. Scott Nay, Underhill.
VIRGINIA: Richmond, June 18-20. Sec., Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.
WISCONSIN: Milwaukee, June 25-28. Sec., Dr. E. C. Murphy, 314 E. Grand Ave., Eau Claire.
WYOMING: June 3-4. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

Book Notices

Mineral Metabolism. By Alfred T. Shohl, M.D., Research Associate in Pediatrics, Harvard University, Boston. American Chemical Society Monograph Series. Cloth. Price, $5. Pp. 384. New York: Reinhold Publishing Corporation, 1939.

There are approximately twenty-four chemical elements in the body. The mineral elements include all but carbon, hydrogen, oxygen and nitrogen. Even these four elements, which make up the organic materials of the body, are found in salts such as ammonium carbonate? Thus the field of mineral metabolism embraces all of physiology. Although the mineral or ash constituents of the body have been known and studied since the beginning of modern chemistry, there have been few comprehensive descriptions of the role of these substances in the structure and function of the body. The present book brings together a vast amount of material, much of it conflicting, which has been scattered in the scientific and medical literature for many years. The author and the publishers have rendered a notable service by making available this brief connected account of the mineral elements in the body.

The material on the mineral composition of the body contains many items of interest. The importance of the skeleton as a reservoir for minerals is emphasized when it is mentioned that it accounts for 83 per cent of the ash of the body. The ash and water of the body are inversely related. As the body grows older, its ash content increases and its water content decreases. Heretofore the data regarding the chloride content of the body at different ages have presented an enigma. The author shows that the chloride tends to be constant, thus maintaining the normal osmotic pressure of the body fluids. Because the water content of the body decreases with maturity, the chloride in the adult is only about half the concentration of chloride in the fetus. Sodium is the only other element which is proportionately less in the adult than in the newborn. Both sodium and chlorine are prominent components of intercellular fluid, which diminishes with maturity. The book contains chapters on the minerals in the physiology of secretion, excretion and the formation of internal secretions. There is a chapter on total base, chloride, ammonium and bicarbonate, and there are chapters on calcium and magnesium, on phosphorus and on each of the other important inorganic elements. Iron, iodine and the elements that occur in traces are not neglected. The chapter on water metabolism is presented in relation to the salts dissolved in the water. There is a chapter on anion-cation relationships and on mineral intakes, balances and requirements during growth, pregnancy and lactation. The significance of the minerals in the acid-base balance of the body is discussed briefly and authoritatively. The relationship is described between sodium and potassium, with particular emphasis on the physiologic differences between these two chemically related elements. In adrenal insufficiency the sodium and potassium ratio of the diet assumes considerable importance. If too much potassium is consumed or if there is failure to give adequate sodium, the latent condition may become manifest; or, if symptoms are already present, they are intensified and death may follow. One reads that in general the Russians consume an acid diet, the Germans an alkaline one. The author concludes that it is still unsettled whether an acid or an alkaline ash diet is more inducive to health. Of spas and mineral waters the author writes "A patient goes to such a place confident that he will attain great benefit. He is located in a pleasant environment which supplies change from his usual activities and worries, and entails also physical rest, mild exercise and recreation. Under such conditions it is not surprising that drinking the waters of the mineral spring produces benefit. Perhaps the consumption of water itself is important, and drinking 7 or 8 glasses of warm 'aqua destillata' under similar conditions would result in physiologic well-being. Added to this, regular life, regular habits, cathartics and a carefully controlled diet would constitute an armamentarium not to be held lightly."

Balance experiments as a means of measuring the dietary requirements for different age groups are critically evaluated. Except for sulfur, which must be supplied in the form of certain amino acids, all the mineral elements can be utilized when furnished as foods or as inorganic salts. The different calcium and phosphorus requirements at different ages can be explained largely on the basis of the type of tissue that is formed. In the young child the growth of skeletal tissue demands calcium, in the older child the growth of muscle tissue demands more phosphorus. Higher intakes of mineral salts result in greater retention by the body, but it is not clear that these will be continued indefinitely or that high intakes are desirable. All things considered, the book represents a valuable monograph which covers a field which has needed clarification and which is important in physiology, nutrition and medicine.

Cardiovascular-Renal Disease: A Clinicopathologic Correlation Study Emphasizing the Importance of Ophthalmoscopy Based on Material Awarded the Frank Billings Gold Medal at the Scientific Exhibit of the Annual Meeting of the American Medical Association, San Francisco, June, 1938. By Lawrence W. Smith, M.D., Professor of Pathology, Temple University School of Medicine, Philadelphia, Edward Weiss, M.D., Professor of Clinical Medicine, Temple University School of Medicine, Walter L. Lillie, M.D., Professor of Ophthalmology, Temple University School of Medicine, Frank W. Konzelmann, M.D., Professor of Clinical Pathology, Temple University School of Medicine, and Edwin S. Gault, M.D., Associate Professor of Pathology, Temple University School of Medicine. Cloth. Price, $4.50. Pp. 227, with 75 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1940.

A book of such composite authorship really should be reviewed by a committee of one pathologist, one internist, one ophthalmologist, a referee and a timekeeper. It comprises a "clinicopathologic correlation study of cardiovascular renal disease, emphasizing the importance of ophthalmoscopy, and is based on the material that was exhibited at the A. M. A. meeting in 1938 and awarded the gold medal." There are five main parts dealing respectively with hypertensive cardiovascular renal disease, essential hypertension, senile atherosclerosis, nephritis and nephrosis. These are followed by a short chapter concerned with the laboratory aspect of the various conditions, and finally an extensive bibliographic chapter that includes practical laboratory tests and graphic analyses. The text is well written, at times in a somewhat colloquial manner, and is poignantly illustrated by comprehensive case reports. All the illustrations are original and consist of either necropsy material or fundus photographs of the reported cases. As the title indicates, especial emphasis is laid on the importance of ophthalmoscopic observations as correlated with clinical and pathologic evidence. The ophthalmologic classification of fundus changes due to cardiovascular renal disease, as popularized by Wagener, is in the main adhered to and the ophthalmoscopic descriptions are good, with emphasis placed on the important aspects and no undue verbosity regarding unessential details. The book is well worth while, for it does much to clear the mental confusion that exists in the mind of the average medical man regarding cardiovascular renal disease, today the greatest cause of death.

Endocrine Gynecology. By E. C. Hamblen, B.S., M.D., F.A.C.S., Associate Professor of Obstetrics and Gynecology, Duke University School of Medicine, Durham, N. C. Foreword by J. B. Collip, M.D., Gilman Cheney Professor of Biochemistry and Pathological Chemistry, McGill University, Montreal. Cloth. Price, $5.50. Pp. 453, with 169 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1939.

Few tasks are more difficult than the task of reviewing the current data and opinions in the field of endocrine gynecology. No such effort will be received with uniform satisfaction. The book by statement is directed to the general practitioner. Many will find difficulty in digesting the volume of material presented, not through any defect in the author's presentation so much as because of the rapidity with which a whole world of information and misinformation has been accumulated in this field. However, any general practitioner with special interest in the medical phases of gynecology dealing with the endocrines may well find in this book what he is looking for in the way of recent orientation. The gynecologist also, while familiar

with much of the data presented, will profit from the orderly and thorough arrangement and presentation of a large body of information.

The author is to be commended for bringing this review to such a recent date. It must have involved a prodigious labor for one also busy with clinical practice and investigative work. The author is likewise to be congratulated for keeping this a book of clinical information concerning strictly the human female rather than the rodent and monkey. In the main he has adhered faithfully to the dictum of Engle that "There is no way to study human physiology other than to study human beings. Experimental animals seem only to prepare the way for human experimentations."

The book has three main divisions. Part one, entitled Sex Endocrine Principles, deals with excellent clarity on the chemistry and pharmacology of the sex principles as well as their related hormones. The second part is concerned with the normal physiology of growth, development, adolescence, maturity and regression. The portion covering growth and development seems overburdened with data in proportion to its importance. Following this ground work the concluding portion of the book discusses endocrinopathic gynecology. In this portion the most grievous error of the book seems to occur. This is the portrayal of numerous so-called classic sex endocrine syndromes. Many of the rare syndromes are probably as "classic" as the author presents them. Such examples are the excessively rare Simmond's disease or the only slightly more common picture of arrhenoblastoma and adult adrenogenitalism (due to tumor of the adrenal cortex). However, it has been the experience of most gynecologists that women with the common endocrine difficulties such as functional menorrhagia or sterility will not all fall neatly into sharply defined groups based on physical characteristics or stature or biometric measurements.

The remaining portion of the book, dealing with functional irregularities of uterine bleeding, functional sterility, gestational abnormalities and the climacteric, is up to the standard of the first section. Along with adequate discussion of endocrine treatment are mentioned some therapeutic futilities and precautions which the reader will do well to heed. Over a thousand important articles are cited in the chapter bibliographies and assimilated aptly into the text and, no doubt, a great many more were consulted.

The book is definitely worth reading and even rereading by those with a serious interest in endocrine gynecology. A chronological summary in the opening pages is helpful in giving a brief panorama of present attainments in endocrinology.

Architecture of the Kidney in Chronic Bright's Disease. By Jean Oliver, Professor of Pathology, Long Island College of Medicine, Brooklyn, N. Y. Cloth. Price, $10. Pp. 257, with 112 illustrations. New York & London: Paul B. Hoeber, Inc., 1939.

This book presents a summary of previously published and more recent studies of diseased human kidneys by the methods of (1) microdissection, for the examination of the structure of renal units (nephrons) and of the vascular channels, (2) sections and staining of blocks of tissue for microscopic examination of all renal elements in unaltered relationship to one another, and (3) reconstruction in plastic form of serial sections of portions of the kidney. The author has made judicious use of imagination and even of a modicum of teleologic reasoning in an attempt to interpret his objective observations and especially to correlate structural alterations of various elements of the kidney with disturbances of renal function. By the method of microdissection he has been able to establish the existence in the diseased human kidney of the aglomerular nephron and has shown that alterations of tubular structure do not depend directly on pathologic changes in the glomerulus, although the two may frequently be affected in the same nephron. He has also been able to make a good case for the probable functioning ability of the aglomerular tubular complex and has demonstrated the sources of blood supply to the tubular portion of the nephron that are independent of glomerular circulation. These are cited merely as a few examples of many important discoveries that could not have been made by any other method. The book is full of observations of great value for a proper concept of the three dimensional structure of the kidneys in chronic Bright's disease, both inflammatory and arteriosclerotic, as well as to an understanding of the probable part played by alterations of structure in the impaired excretory function and other important manifestations of renal disease. The problem is of great complexity because the variations of structure of the nephron in a single diseased kidney are legion, in striking contrast to their remarkable uniformity found by Peter in the normal organ. The author rightly feels that he has not exhausted the subject and that some of his interpretations, especially those affecting function, may not be correct; yet the great importance of his contribution to the subject of chronic Bright's disease is obvious from a perusal of the book. The presentation of the subject is well planned. The summaries and frequent "comments," forceful yet restrained and cautious, make for easy reading and understanding of the subject. The Macy Foundation is to be congratulated on making possible the publication of such a valuable book. It is also greatly to the credit of the publisher and entirely in keeping with the policy of the late Paul Hoeber that the publication of a book on such a highly specialized subject was undertaken. The print, illustrations and general physical characters of the book are of high quality. An index would have added value to the book for those especially interested in the subject.

Study of the Distribution of Medical Care and Public Health Services in Canada. Paper. Pp. 184. Toronto: The National Committee for Mental Hygiene (Canada), Division on Public Health and Medical Services, 1939.

The close resemblance between medical problems and proposed solutions in Canada and the United States is clearly shown in this study. Maternal and infant mortality, tuberculosis, cancer, the care of the indigent, and the rural population present the same questions and are being dealt with in much the same way. The description of these adds information that is helpful in conducting experiments in the United States. The report of the study is a compact and valuable handbook for every one interested in the economic problems of medicine.

Dental Health Organizations in State Departments of Health of the United States. By F. C. Cady, Dental Surgeon. From the Division of Domestic Quarantine, Public Health Service. Prepared by direction of the Surgeon General, Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 251. Paper. Price, 15 cents. Pp. 96. Washington, D. C.: Supt. of Doc., Government Printing Office, 1939.

Dental personnel are detailed to four divisions of the U. S. Public Health Service: Division of Marine Hospitals and Relief, Division of Domestic Quarantine, Division of Mental Hygiene and the National Institute of Health. The Division of Domestic Quarantine (States Relation) has added a dental consultation service to provide advice on the organization and administration of dental health services in state and local health departments. The National Institute of Health has conducted research into various dental problems connected with public health. The first appointment of a dentist on a state board of health was in Virginia in 1916. By July 1, 1938, there were dental divisions or subdivisions in thirty-five state departments of health. The organization and functions of the dental sections in each of these state departments is described.

Cancer Mortality in the United States. I: Trend of Recorded Cancer Mortality in the Death Registration States of 1900 from 1900 to 1936. By Mary Gover, Associate Statistician, U. S. Public Health Service. From the Division of Public Health Methods, National Institute of Health. Prepared by direction of the Surgeon General, Federal Security Agency, U. S. Public Health Service, Public Health Bulletin No. 248. Paper. Price, 10 cents. Pp. 58, with 16 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1939.

There have been many studies of the trend in cancer mortality, but conclusions are exceedingly difficult because of the many factors involved, including better diagnosis now than in the past, the increasing average age of the population and improved statistical methods. This pamphlet, by an experienced statistician, constitutes an able report on the subject.

Jewish Contributions to Medicine in America from Colonial Times to the Present. By Solomon R. Kagan, M.D. Foreword by Prof. James J. Walsh. Second edition. Cloth. Price, $3.50. Pp. 192, with 69 illustrations. Boston: Boston Medical Publishing Company, 1939.

The first edition of this book was published in 1934. The present volume has been considerably extended, so that the book now includes a large amount of important data regarding its subject. There are numerous illustrations, bibliographies and notes, and there is a comprehensive index of personal names.

Poliomyelitis in the City of Melbourne 1937-8. By Hilda W. Bull, B.Sc., M.B., B.S., Medical Officer, Department of Health, Melbourne City Council. Published under the Authority of the Health Committee of the Melbourne City Council. Paper. Gratis. Pp. 56, with illustrations. Melbourne, [n. d.].

In the outbreak of poliomyelitis at Melbourne in 1937-1938, 174 persons had paralytic poliomyelitis, of whom 152 with paralysis survived. Twelve died, six recovered without paralysis and four were nonresidents. Thirty-six recovered after periods of treatment ranging from three to twelve months and were discharged. One hundred and one were still under treatment at the time of the report. The report, however, constitutes particularly a good epidemiologic study of infantile paralysis.

Industrial Health: Asset or Liability. By C. O. Sappington, A.B., M.D., Dr.P.H. Cloth. Price, $3.75. Pp. 224, with portrait. Chicago: Industrial Commentaries, 1939.

The years of experience of Dr. Sappington make him an eligible choice for a work on industrial health. His book is essentially an outline which begins with a general discussion of the nature of health service and its philosophy, considers many special problems, and discusses as well the practice of industrial health as a specialty. In thirteen main conclusions he summarizes the significant facts brought out by this volume. It is interesting to learn that the sources of the most costly kind of illnesses among employees are largely nonindustrial but the effects are industrial. The author supplies information as to sources of important material. A large appendix to the book provides a series of forms for the use of those interested in industrial health work.

Harvey Cushing's Seventieth Birthday Party, April 8, 1939. Speeches, Letters, and Tributes. Published for the Harvey Cushing Society. Cloth. Price, $3. Pp. 144, with 9 illustrations. Springfield, Illinois, & Baltimore: Charles C. Thomas, 1939.

This is essentially a souvenir volume which every one who knew Dr. Cushing will want to own. It contains telegrams, appreciations, greetings, letters, spontaneous tributes and similar notes regarding the life of Dr. Cushing. The work is published *con amore*.

Food Values of Portions Commonly Used. First edition compiled by Anna deFlanter Bowes, M.A., Director, Nutrition Education, Philadelphia Child Health Society, Philadelphia, and Charles F. Church, M.D., M.S. Second edition by Senior Author. Paper. Price, $1. Pp. 31. Philadelphia: The Author, 1939.

Such works as these are invaluable in the selection of suitable diets for both those who are sick and those who simply want to reduce. Nowadays we must be intelligent about our mineral salts and vitamins—if nothing else!

What to Do in Case of Accident. Adapted from the article entitled "First Aid to the Injured" by Senior Surgeon M. H. Foster. Revised edition, 1937. Federal Security Agency, United States Public Health Service. Miscellaneous Publication 21. Paper. Price, 10 cents. Pp. 71, with 21 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1939.

This is a revised pamphlet based on one first published in 1937—a government document exceedingly useful for those living in the country districts or those in charge of first aid stations in industry.

A Mirror for Surgeons: Selected Readings in Surgery. By Sir D'Arcy Power, K.B.E., F.R.C.S., Consulting Surgeon to and Archivist at St. Bartholomew's Hospital, London. Cloth. Price, $2. Pp. 250. Boston: Little, Brown & Company, 1939.

This is a collection of brief biographic sketches of some twenty-two noted surgeons, with quotations from their most significant works. Among Americans included are John Collins Warren, Halsted, Bigelow and Sims. The book should actually be an inspiration to every young American interested in surgery as a career.

Industrial Hygiene. By Various Authors. Edited by A. J. Lanza, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, and Jacob A. Goldberg, M.A., Ph.D., Secretary, Industrial Hygiene Committee, New York Tuberculosis and Health Association. Cloth. Price, $8.50. Pp. 743, with 46 illustrations. New York, Toronto & London: Oxford University Press, 1939.

This symposium provides a series of essays by specialists in industrial disease who cover such subjects as the scope and organization of health service in industry, physical examination of employees, the relationship of industry to various systems of the human body, and also discussions of special topics like lighting, chemical poisoning and the hygiene and health of the railroad worker. The book is beautifully printed, authoritative and well illustrated, and each chapter has a suitable bibliography so that altogether it is one of the most useful reference works thus far made available. Finally, the book is supplemented by a most comprehensive index.

Das Ärztebüchlein: Eine Sammlung beziehlicher Worte für die Feierstunde des Arztes, zugleich ein Ratgeber für die tägliche Praxis. Unter Mitbenutzung hinterlassener Aufzeichnungen Erwin Liek's. Von Walther Klusemann. Mit einem Geleitwort von Professor Dr. Klare. Second edition. Cloth. Price, 6 marks. Pp. 267. Leipzig: Georg Thieme, 1940.

This is an excellent collection of aphorisms, paragraphs and brief essays related to the practice of medicine, most of them from the German or from ancient sources. One reads them with a feeling of nostalgia for the German medicine that used to be.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Dental Practice Acts: Clinic Operated by Dental College; Recoupment of Overhead Expenses from Patients.—The governor of Georgia, acting on behalf of the state and on relation of the fifth district dental society, sought to enjoin the Atlanta Southern Dental College from practicing dentistry in connection with a dental clinic operated by it. The trial court gave judgment for the college and the plaintiff appealed to the Supreme Court of Georgia.

The dental practice act of Georgia, in part, declares as engaged in the practice of dentistry all persons who shall "charge a fee or salary or any other reward" for specified operations on the teeth, gums or jaws. It further provides that nothing in it shall prohibit regularly chartered dental departments of reputable colleges and universities from maintaining regular college clinics under the supervision of regularly licensed and registered demonstrators. The trial court instructed the jury, in effect, that the defendant college could, without violating the dental practice act, charge clinic patients fees sufficient to take care of overhead expenses, including such items as materials, lights, electric current, water, laundry, obsolescence and depreciation in building and equipment, heat, repairs, printing and stationery, clerks, janitors, maids and such other things as are necessary in the conduct and operation of the clinic. Such a charge, the jury was instructed, would result in no profit to the clinic and would not, therefore, constitute "a fee or salary or any other reward" within the meaning of the dental practice act.

With this interpretation of the act, the Supreme Court could not agree. The object of dental practice, said the court, is to accomplish results which may be done by skilful service alone, as by extracting teeth, or by skilful service plus the furnishing of material adapted to the particular case, such as filling teeth. The statutory definition of dentistry literally refers to service alone, but what the term service embraces must be determined in connection with incidental things convenient or necessary to rendition of the service. When so considered, all such things incidental to the several kinds of service specified in the definition are to be included as overhead or part of the service. Where charges are made for one or more of the overhead or incidental services in connection with operations specifically mentioned in the definition, the practice of performing such operations and charging therefor constitutes the practice of dentistry within the meaning of the statutory definition. Lights, electric current, water, laundry, obsolescence and depreciation in building and equipment, heat, repairs, printing and stationery, clerks, maids and the like, used by the practitioner in connection with his dental office, are incidental or overhead adjuncts, and the inclusion of one or more of these in charges for operations of any of the kinds specified in the act would bring the practice within the statutory definition.

The court did not discuss the exemption in the dental practice act authorizing the operation of clinics by dental colleges

other than by quoting with approval from the case of *Boybin v. Atlanta Southern Dental College*, 177 Ga. 1, 169 S. E. 361:

> Much stress is placed by counsel for the defendant on the foregoing words which permit reputable dental colleges and universities to maintain "regular college clinics." The act nowhere defines those words. It does clearly define the "practice of dentistry." Where one charges a fee or salary or any reward, whether paid or unpaid to any one directly or indirectly for dental work, he practices dentistry according to the act. . . . The legislative intent is too clear to permit, by mere construction, an indefinite expression to defeat a definite provision. The indefinite expression, "regular college clinic," must conform to the definite provision as to what constitutes "practice of dentistry" and who may practice. The matter of what constitutes and who may practice dentistry is the major object of the law, and the reference to dental clinics is incidental.

The Supreme Court in the present case, because the trial court had erroneously instructed the jury, reversed the judgment for the defendant college.—*Rivers, Governor, et al. v. Atlanta Southern Dental College (Ga.), 1 S. E. (2d) 750.*

Malpractice: Negligence in After-Care of Patient Following Childbirth.—The plaintiff gave birth to a baby Jan. 5, 1936, the defendant being the attending physician. For alleged negligence in failing properly to care for her following the birth of the baby and attributing her injuries to that negligence, the plaintiff sued the defendant. The trial court, after the plaintiff's evidence had been submitted and without hearing the physician's defense, dismissed the case, and the plaintiff appealed to the Supreme Court of Oregon.

The plaintiff submitted evidence tending to show that the defendant neither examined nor visited her following the birth of her baby until after she was removed, with his consent, from the maternity home on January 15, except that he did, on the day after delivery, stand in the doorway of her room and ask a nurse as to the welfare of the baby. By January 7 a puerperal infection had developed, but from what cause does not appear in the published report. Thereafter the patient's temperature remained elevated throughout her stay at the maternity home. Two days after the baby was born, the plaintiff's evidence showed, a nurse reported to the defendant that the plaintiff's temperature was 104 F. and requested him to see the plaintiff, which he did not do. The next day her temperature was 102 F. The plaintiff testified that on January 9 pus began to discharge from her vagina and the plaintiff's mother testified that, on January 11, she herself told the defendant that her daughter was not feeling as well as she should and desired him to visit her. A medical witness for the plaintiff who had examined her during the two months preceding the trial testified in answer to a hypothetic question that he did not think the defendant's treatment of the plaintiff during her stay at the maternity home constituted proper treatment and that if proper treatment had been given her condition probably could have been alleviated.

In the judgment of the court, the plaintiff made out a prima facie case that the defendant was negligent and that his negligence was the proximate cause of her injuries. Her suit should not therefore have been dismissed.

In remanding the case for further consideration, the Supreme Court pointed out that the defendant's defense had not been presented and expressly disclaimed any intention of discrediting or prejudicing that defense.—*Carter v. Howard (Ore.), 86 P. (2d) 451.*

Society Proceedings

COMING MEETINGS

American Medical Association, New York, June 10-14. Dr. Olin West, 535 N. Dearborn St., Chicago, Secretary.

American Association for the Surgery of Trauma, Atlantic City, N. J., June 7-8. Dr. Ralph G. Carothers, 409 Broadway, Cincinnati, Secretary.

American Association for Thoracic Surgery, Cleveland, June 6-8. Dr. Richard H. Meade Jr., 2116 Pine St., Philadelphia, Secretary.

American Association of Genito-Urinary Surgeons, Skytop, Pa., June 20-22. Dr. Charles C. Higgins, 2020 East 93d St., Cleveland, Secretary.

American Association of the History of Medicine, Atlantic City, N. J., May 4-5. Dr. Henry E. Sigerist, 1900 East Monument St., Baltimore, Secretary.

American Association on Mental Deficiency, Atlantic City, N. J., May 22-26. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.

American Broncho-Esophagological Association, New York, June 5. Dr. Paul Holinger, 1150 N. State St., Chicago, Secretary.

American College of Chest Physicians, New York, June 8-10. Dr. Robert B. Homan Jr., P. O. Box 1069, El Paso, Texas, Secretary.

American College of Radiology, New York, June 12. Mr. M. F. Cahal, 540 North Michigan Bvld., Chicago, Executive Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., June 10-11. Dr. Albert F. R. Andresen, 88 Sixth Ave., Brooklyn, N. Y., Secretary.

American Gynecological Society, Quebec, Canada, June 17-19. Dr. Richard W. TeLinde, 11 East Chase St., Baltimore, Secretary.

American Heart Association, New York, June 7-8. Dr. Howard B. Sprague, 50 West 50th St., New York, Secretary.

American Laryngological Association, Rye, N. Y., May 27-29. Dr. C. J. Imperatori, 108 East 38th St., New York, Secretary.

American Laryngological, Rhinological and Otological Society, New York, June 6-8. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.

American Medical Women's Association, New York, June 9-10. Dr. Elizabeth Parker, 1835 Eye St., Washington, D. C., Secretary.

American Neurological Association, Rye, N. Y., June 5-7. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 3-5. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.

American Orthopedic Association, Kansas City, Mo., May 6-9. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn. Secretary.

American Otological Society, Rye, N. Y., May 30-31. Dr. Isidore Friesner, 36 East 73d St., New York, Secretary Pro-Tem.

American Pediatric Society, Skytop, Pa., May 2-4. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.

American Proctologic Society, Richmond, Va., June 9-11. Dr. Curtice Rosser, 710 Medical Arts Bldg., Dallas, Texas, Secretary.

American Psychiatric Association, Cincinnati, May 20-24. Dr. Arthur H. Ruggles, 305 Blackstone Blvd., Providence, R. I., Secretary.

American Radium Society, New York, June 10-11. Dr. William E. Costolow, 1930 South Hope St., Los Angeles, Secretary.

American Society for Clinical Investigation, Atlantic City, N. J., May 6. Dr. Eugene M. Landis, University of Virginia Hospital, Charlottesville, Va., Secretary.

American Society of Clinical Pathologists, New York, June 6-10. Dr. Alfred S. Giordano, 531 N. Main St., South Bend, Ind., Secretary.

American Surgical Association, St. Louis, May 1-3. Dr. Charles G. Mixter, 219 Longwood Ave., Boston, Secretary.

American Therapeutic Society, New York, June 7-8. Dr. Oscar B. Hunter, 1835 Eye St. N.W., Washington, D. C., Secretary.

Association for the Study of Internal Secretions, New York, June 10-11. Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.

Association of American Physicians, Atlantic City, N. J., May 7-8. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.

California Medical Association, Coronado, May 6-9. Dr. George H. Kress, 450 Sutter St., San Francisco, Secretary.

Connecticut State Medical Society, Hartford, May 22-23. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.

Florida Medical Association, Tampa, Apr. 29-May 1. Dr. Shaler Richardson, 111 West Adams St., Jacksonville, Secretary.

Illinois State Medical Society, Peoria, May 21-23. Dr. Harold M. Camp, 224 South Main St., Monmouth, Secretary.

Iowa State Medical Society, Des Moines, May 1-3. Dr. R. L. Parker, 3510 Sixth Ave., Des Moines, Secretary.

Kansas Medical Society, Wichita, May 13-16. Mr. Clarence G. Munns, 112 West Sixth St., Topeka, Executive Secretary.

Massachusetts Medical Society, Boston, May 21-22. Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary.

Mississippi State Medical Association, Jackson, May 14-16. Dr. T. M. Dye, Merchants Bldg., Clarksdale, Secretary.

Missouri State Medical Association, Joplin, Apr. 30-May 1. Mr. E. H. Bartelsmeyer, 634 North Grand Blvd., St. Louis, Executive Secretary.

Montana Medical Association of, Bozeman, June 18-20. Dr. Thomas F. Walker, 206 Medical Arts Building, Great Falls, Secretary.

National Gastroenterological Association, New York, June 4-6. Dr. G. Randolph Thomson 319, 1819 Broadway, New York, Secretary.

National Tuberculosis Association, Cleveland, June 3-6. Dr. Charles J. Hatfield, 50 West 50th St., New York, Secretary.

New Hampshire Medical Society, Manchester, May 14-15. Dr. Carleton R. Metcalf, 5 South State St., Concord, Secretary.

New Jersey, Medical Society of, Atlantic City, June 4-6. Dr. Alfred Stokl, 35 Lincoln Park, Newark, Secretary.

New Mexico Medical Society, Albuquerque, May 27-29. Dr. L. B. Cohenour, 219 West Central Ave., Albuquerque, Secretary.

New York, Medical Society of the State of, New York, May 6-9. Dr. Peter Irving, 2 East 103d St., New York, Secretary.

New York State Association of Public Health Laboratories, Rochester, May 20. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.

North Carolina, Medical Society of the State of, Pinehurst, May 13-15. Dr. T. W. M. Long, 321 Hamilton St., Roanoke Rapids, Secretary.

North Dakota State Medical Association, Minot, May 6-8. Dr. Albert W. Shelsey, 209½ North Broadway, Fargo, Secretary.

Ohio State Medical Association, Cincinnati, May 14-16. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.

Oklahoma State Medical Association, Tulsa, May 6-8. Dr. L. S. Willour, 210 Plaza Court Bldg., Oklahoma City, Secretary.

Rhode Island Medical Society, Providence, June 5-6. Dr. Guy W. Wells, 124 Waterman St., Providence, Secretary.

Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., May 4. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.

Society of Surgeons of New Jersey, Paterson, May 22. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.

South Carolina Medical Association, Charleston, Apr. 30-May 2. Dr. E. A. Hines, Seneca, Secretary.

South Dakota State Medical Association, Watertown, May 20-22. Dr. Clarence E. Sherwood, Madison, Secretary.

Texas, State Medical Association of, Dallas, May 13-16. Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases, Huntington, Ind.

7:53-84 (Feb.) 1940

Gastro-Ileac Reflex: Further Experimental Observations. D. M. Douglas and F. C. Mann, Rochester, Minn.—p. 53.
Use of Hydrated Trisilicate of Magnesium for Peptic Ulcer. M. Kraemer, Newark, N. J., with technical assistance of B. Aaron, New York.—p. 57.
*Does Bran Produce Intestinal Obstruction? B. Fantus and G. G. Kopstein, Chicago.—p. 60.
Primary Ulcer of Jejunum. L. H. Berry and U. G. Dailey, Chicago.—p. 63.
Study of Liver Function in Experimental "Peptic" Ulcer. A. Reymont, Chicago.—p. 65.
Relation of Blood Carbon Dioxide and Dehydration to Gastric Acidity. F. W. Taylor and A. C. Michael, Indianapolis.—p. 67.
Early Diagnosis of Cancer of Pancreas. J. E. Dunphy, Boston.—p. 69.
Effect of Enteral Absorption of Fluids on Recovery of Blood Pressure After Severe Hemorrhage. E. J. Van Liere, D. W. Northup and P. E. Vaughan, Morgantown, W. Va.—p. 71.
Gastric Analyses and Gastric Symptoms in Diabetes Insipidus. H. Blotner, Boston.—p. 73.
Abnormal Mechanism for Excitation of Gastric Secretion in Dog. A. C. Ivy and W. H. Bachrach, Chicago.—p. 76.
Experimental Studies on Production of Peptic Ulcers by Vasomotor Alterations (Pitressin Episodes). M. Berg, Chicago.—p. 78.
*Clinical Notes on Use of Immunized Donors in Chronic Bacillary Dysentery. J. Felsen, New York.—p. 81.

Bran and Intestinal Obstruction.—Fantus and Kopstein reviewed the literature on bran impaction of the intestine and found only four cases of this type. In three the impaction was preceded by gross intestinal pathologic changes. The description of the fourth case (Davis) does not permit an adequate analysis as to its nature, but a predisposing cause was probably present. Therefore bran is obviously not prone to produce intestinal obstruction unless an organic predisposing cause is present. In the presence of intestinal ulceration, stenosis or disabling adhesions, its ingestion is contraindicated.

Blood from Immunized Donors for Bacillary Dysentery.—Felsen states that the blood of volunteers immunized with D-C vaccine (Bacillus dysenteriae, hemolytic and nonhemolytic Bacillus coli, enterococcus) has been found particularly beneficial to extremely sick patients who cannot respond to active immunization. Serologic and cultural studies indicate that a definite rise in agglutinins and bactericidal power occurs in both donor and recipient but that they do not persist for as long a period in the patient as when direct active immunization is carried out. In order to supplement this method of therapy, rabbits are being prepared in a similar manner. They will be bled only when needed in an emergency when the time element is an important factor. By keeping the blood titer high and collecting the serum only as required, it is hoped that the same general favorable response will be attained with rabbit serum as with unmodified human blood.

American Journal of Pathology, Boston

16:1-102 (Jan.) 1940. Partial Index

Experimental Infectious Angiitis. M. C. Winternitz and P. M. LeCompte, New Haven, Conn.—p. 1.
Studies on Inflammation: XVIII. Mechanism of Leukocytosis with Inflammation. V. Menkin, Boston.—p. 13.
*Origin of Perineural Fibroblastoma. I. M. Tarlov, Brooklyn.—p. 33.
Wernicke's Disease: Identity of Lesions Produced Experimentally by B1 Avitaminosis in Pigeons with Hemorrhagic Polioencephalitis Occurring in Chronic Alcoholism in Man. L. Alexander, Boston.—p. 61.
*Growth Disorder of Skull in Mongolism. C. E. Benda, Boston.—p. 71.

Origin of Perineural Fibroblastoma.—Tarlov believes that he is the first to demonstrate by direct staining methods that the type cell of two perineural fibroblastomas of the vagus nerve roots studied by him was not the Schwann cell type. Dockrill's modification of Hortega's silver impregnation technic was the method employed for the demonstration of Schwann cells. Direct staining brought out normal and proliferating Schwann cells excluding the Schwann cell as the type cell of the encapsulated tumor of the peripheral nerves. The type cell of these tumors presented morphologic characteristics of the fibroblast. The term perineural fibroblastoma should be retained for these tumors although it must be realized that they may arise from endoneurium, as in the case of the tumors of the vagus nerve roots. Although the occurrence of nerve fibers within an encapsulated tumor of a peripheral nerve is usually characteristic of multiple neurofibromatosis, an occasional nerve fiber may occur within a solitary perineural fibroblastoma.

Growth Disorder of Skull in Mongolism.—To the two conditions cretinism and chondrodysplasia known to be associated with a marked shortening of the length of the base of the skull, Benda adds a third entity, mongolism, which his studies have proved to be associated with a failure of the development of the skull in length. In chondrodysplasia growth of the base of the skull is arrested because of lack of development of the cartilage, which is absorbed early and is replaced by ossified tissue. In cretinism growth of the bones of the skull is delayed because of lack of transformation of cartilage into bone. The cartilaginous spaces in cretinism are open much longer than normally. In mongolism the situation is much more complicated. Benda studied bones from eight cases of mongolism. These comprised the synchondrosis sphenoccipitalis from six cases, the synchondrosis spheno-ethmoidalis from two cases and vertebrae from six cases. There is a strong indication that the growth disorder in mongolism is due to the absence of agents which induce differentiation and growth. It is generally assumed that these factors are related in some way to the pituitary gland. Lauche expressed the opinion that the growth disorder in mongolism is the reverse of acromegaly. Studies of the pituitary gland led Benda to the conclusion that an insufficiency of the anterior lobe is responsible for the postnatal growth disorder in mongolism. Microscopic study demonstrates that proliferation of the epiphysial cartilage is absent or insufficient. The growth disorder in mongolism is not restricted to the cartilaginous epiphysial lines but involves also the membranous bones. An analysis of the observations suggests that the development of the growth disorder known as mongoloid deficiency appears to be dependent on a congenital absence or deficiency of those agents which, either from hypophysial or from extrahypophysial sources, stimulate differentiation and growth.

American Journal of Psychiatry, New York

96:771-1008 (Jan.) 1940. Partial Index

Biochemistry of Epilepsy: Review. H. Goldstein and R. A. McFarland, New York.—p. 771.
Evaluation of Electro-Encephalograms of Schizophrenic Patients. P. A. Davis, Boston.—p. 851.
Electro-Encephalography in the Psychoses: Localization of Cerebral Atrophy. M. A. Rubin, Worcester, Mass.—p. 861.
*Five to Ten Year Follow-Up Study of 641 Schizophrenic Cases. C. Rupp and Elizabeth K. Fletcher, Howard, R. I.—p. 877.
Relationship Between Early Schizophrenia and Neuroses. W. R. Miller, Iowa City.—p. 889.
Psychotic Manifestations in Presence of Acute Cerebral Vascular Lesions. C. W. Irish, Los Angeles.—p. 897.
Effect of Treatment of Depression in Menopause with Estrogenic Hormone. H. S. Ripley, E. Shorr and G. N. Papanicolaou, New York.—p. 905.
Detoxication of Sodium Benzoate in Neuropsychiatric Disorders: Excretion of Hippuric Acid After Ingestion of Sodium Benzoate. I. Finkelman, Chicago; J. Hora, Elgin, Ill.; I. C. Sherman, Chicago, and M. K. Horwitt, Elgin, Ill.—p. 951.
*Observation on Treatment of Mental Cases with Subshock Doses of Insulin. C. R. Bennett and T. K. Miller, Camarillo, Calif.—p. 961.
*Therapeutic Quartan Malaria in Treatment of Neurosyphilis Among Negroes: Progress Report. G. C. Branche, Tuskegee, Ala.—p. 967.

Long-Time Follow-Up of Schizophrenic Patients.—In their follow-up study of 641 patients diagnosed as having schizophrenia, Rupp and Fletcher present the long-time prognosis of patients not receiving specific (pharmacologic) treatment. As the cases represent first admissions to the Rhode Island State Hospital for Mental Diseases between 1929 and 1934, at least four and a half years had elapsed between admission and follow-up. An attempt to secure adequate information regarding the present status (as of June 1, 1939) of the 641 patients was made. Personal examination of 394 patients

was possible; information of only 125, including twenty-eight in other hospitals, was available; eighty-nine patients were dead and thirty-three were lost. As patients were frequently allowed to leave the hospital in custody of relatives because they were considered harmless rather than because of any essential improvement, they were classified as being either much improved (able to make a good social and work adjustment at a level as high as before their illness and who were entirely free from any residual symptoms), improved (able to make some sort of a social and work adjustment and whose psychotic symptoms were ameliorated, although still present) or unimproved (patients showing no abatement of psychotic symptoms and who required close supervision either inside or outside of a mental hospital). Of the 608 patients on whom adequate follow-up data were obtained, 6.6 per cent were much improved, 15.3 per cent improved, 63.5 per cent unimproved and 14.6 per cent dead. Classification on the basis of diagnostic subtype showed that 35 per cent of the simple, 16.4 per cent of the hebephrenic, 30 per cent of the catatonic, 16 per cent of the paranoid and 36.4 per cent of the "other" types were much improved or improved. Many of the cases in the latter category were of the so-called schizo-affective type. The age of onset of psychotic symptoms had little bearing on the outcome, except that those patients having an onset at the age of 45 or later tended to do less well. Of the patients who were affected for less than six months prior to hospitalization 34.5 per cent were much improved or improved, and likewise 29.4 per cent with symptoms of from six to eleven months, 27.8 per cent with symptoms of from twelve to twenty-three months and only 16 per cent with symptoms of two years or longer. Of the patients hospitalized for six months or less 75.3 per cent were improved, while only 4.2 per cent of those remaining in the hospital for five years or longer were improved. Patients requiring hospital care for more than two years showed little tendency to improve. Disregarding the dead and untraced cases 259, or approximately 50 per cent, of 519 patients left the hospital at some time or other for more than one month; of these 129 have continued to remain outside the hospital while forty-seven returned temporarily and eighty-three permanently. The much improved and improved groups of patients were more likely to remain out of the hospital continuously and also showed a smaller percentage of readmissions than the unimproved group. Pulmonary tuberculosis was responsible for forty-three, or 48.2 per cent, of eighty-nine deaths. Ten patients committed suicide.

Treatment of Mental Cases with Less Than Shock Doses of Insulin.—Bennett and Miller used insulin in smaller doses than the amount required for shock in 125 mental cases presenting problems which in the past led to the use of restraint and sedation. Patients presenting behavior problems are candidates for subshock insulin therapy. The two contraindications to this treatment are old arteriosclerotic individuals and patients who are at the point of death or who are physically so weak that the slightest disturbance might prove disastrous. Suspected or known cases of active pulmonary tuberculosis and all other acute infectious diseases of course are contraindications. The authors find it difficult to tabulate results statistically, as the therapy was instituted purely on an empirical basis. Therefore conclusions are drawn from objective analysis of their experience. They state that nearly every case of acute manic excitement was controlled within an average period of thirty-six hours after adequate insulin dosage without the recourse to sedatives or hydrotherapy. The use of sedatives has been reduced approximately 60 per cent in all cases, and almost 100 per cent in cases of extreme psychomotor activity. Its use now is limited to the epileptic and to nocturnal disturbances when it is not practical to give insulin. Tube feedings have been eliminated 90 per cent. Clinical improvement in newly admitted cases of early dementia praecox, manic-depressive psychosis and involution melancholia is in many instances almost miraculous because of the rapidity with which the changes occur. This improvement does not continue if the insulin is discontinued as soon as improvement is noticeable. Usually from three to eight weeks of continued treatment is required to produce satisfactory periods of remission. All patients improve markedly in their physical status, gaining weight on an average of 15 pounds (6.8 Kg.) within six weeks. Caruncles, carbuncles and acne simplex in these patients disappear quickly. It is largely routine now to give insulin to any patient threatened with "boils." Acne does not always respond favorably. The so-called disturbed ward is practically eliminated.

Quartan Malaria for Neurosyphilis Among Negroes.—Of 346 Negro patients given quartan malarial therapy between November 1932 and November 1938, Branche states, a diagnosis of dementia paralytica was made in 306 cases, dementia paralytica with tabes in six, meningovascular neurosyphilis in thirty-three and tabes dorsalis in one. Of the patients 242 responded to the first inoculation, seventy-one to the second, fifteen to the third and eighteen failed to respond after repeated inoculations. Complete remission with minor or no residual defects occurred in 146, or 42 per cent. Good remission with mild to moderate residual defects was experienced by 103, or 30 per cent. The patients show excellent hospital adjustment and they require a limited amount of supervision outside the institution. The condition of seventy-one was unimproved or arrested with pronounced residual defects. Six patients died directly or indirectly from the malarial therapy and twenty died from other causes. The quartan strain of malaria appears to be of great value in the treatment of neurosyphilis, particularly in the Negro.

Archives of Neurology and Psychiatry, Chicago

43: 429-614 (March) 1940

Spread of Epileptic Discharge: Experimental Study of After-Discharge Induced by Electrical Stimulation of Cerebral Cortex. T. C. Erickson, Montreal.—p. 429.
*Experimental Evidence of Anticonvulsant Properties of Sodium Diphenyl Hydantoinate (Dilantin Sodium N. N. R.). H. H. Goldstein and J. Weinberg, Chicago.—p. 453.
Heat Regulatory Mechanisms in Normal and in Schizophrenic Subjects Under Basal Conditions and After Administration of Dinitrophenol. H. Freeman, Worcester, Mass.—p. 456.
Mineral Content of Brain: Changes in Experimental Animals Following Injections of Insulin and Metrazol. E. Liebert and Gert Heilbrunn, Elgin, Ill.—p. 463.
Electro-Encephalogram in Cases of Neoplasms of Posterior Fossa. J. R. Smith, C. W. P. Walter and R. W. Laidlaw, New York.—p. 472.
Dissociation of Deep Sensibility at Different Levels of Central Nervous System. E. A. Weinstein and M. B. Bender, New York.—p. 488.
Section of Descending Spinal Root of Fifth Cranial Nerve. F. C. Grant, R. A. Groff and F. H. Lewy, Philadelphia.—p. 498.
Colloid Cysts of Third Ventricle: Report of Four Cases. M. R. Shaver, Toronto.—p. 510.
*Myoclonus Epilepsy. C. Davison and M. Keschner, New York.—p. 524.
Electrical Activity of Exposed Human Brain: Description of Technic and Report of Observations. H. G. Schwartz and A. S. Kerr, St. Louis.—p. 547.
Metrazol Treatment of Psychoses: Report of Two Deaths. N. Michael and J. Wittenbrook, Columbus, Ohio.—p. 560.
Spontaneous Hemorrhage into Oculomotor Nerve with Rupture of Nerve and Fatal Subarachnoid Hemorrhage. A. Plaut and M. Dreyfuss, New York.—p. 564.

Anticonvulsant Properties of Dilantin Sodium.—Goldstein and Weinberg observed that, in addition to diminishing the frequency of epileptic seizures, dilantin sodium exhibited a definite anticonvulsant action when administered previous to drugs with convulsive properties. Of nineteen epileptic patients given metrazol subcutaneously, the number of seizures produced was in excess of 52.68 per cent. When dilantin sodium was given for one month or longer previous to the administration of metrazol, the number of grand mal seizures fell to 7.14 per cent. Putnam and Merritt expressed the belief that dilantin sodium is more effective against grand mal than against petit mal seizures or epileptic equivalents. The fact that petit mal seizures occurred in 21.05 per cent of patients who had not been given dilantin sodium and in 28.57 per cent of patients who had received the drug is interesting.

Myoclonus Epilepsy.—Davison and Keschner encountered three cases of myoclonus epilepsy and made a microscopic study of the brain and spinal cord of one of them. Two of the patients presented a familial history of the disorder. The myoclonus of the first two patients was associated with mental symptoms and generalized convulsions. Extrapyramidal symptoms and signs were present in all three cases and cerebellar signs in one. Microscopic study of the one case showed inclusion bodies, consisting of amyloid and argentophilic substances, with amitotic division in some throughout the nerve and glia cells of the central nervous system, except the spinal cord. The substantia

nigra and the dentate nuclei were the main sites of these bodies. In correlating the clinical picture with the pathologic changes, the authors are inclined to attribute the mental symptoms to the involvement of the cerebral convolutions, especially the frontal, and the so-called extrapyramidal symptoms to lesions in the substantia nigra. The myoclonus may possibly be due to the changes in the dentate mechanism, as in palatal myoclonus.

Archives of Surgery, Chicago

40: 373-584 (March) 1940

*Neurologic Picture of Herniations of Nucleus Pulposus in Lower Part of Lumbar Region. R. G. Spurling and E. G. Grantham, Louisville, Ky.—p. 375.
Pathology of Intervertebral Disk. J. B. deC. M. Saunders and V. T. Inman, San Francisco.—p. 389.
*Compression of Spinal Cord and Nerve Roots by Herniation of Nucleus Pulposus in Cervical Region. B. Stookey, New York.—p. 417.
*Clinical Aspects of Protruded Intervertebral Disk. H. B. Macey, Rochester, Minn.—p. 433.
Iodized Oil Myelography: Use in Diagnosis of Rupture of Intervertebral Disk into Spinal Canal. A. O. Hampton, Boston.—p. 444.
*Intraspinal Protrusion of Intervertebral Disks. J. G. Love and M. N. Walsh, Rochester, Minn.—p. 454.
Xanthoma of Tendon Sheaths and Synovial Membranes: Clinical and Pathologic Study. J. D. B. Galloway, Huntington, W. Va., A. C. Broders and R. K. Ghormley, Rochester, Minn.—p. 485.
Review of Urologic Surgery. A. J. Scholl, Los Angeles; F. Hinman, San Francisco; A. Von Lichtenberg, Budapest, Hungary; A. B. Hepler, Seattle; R. Gutierrez, New York; G. J. Thompson, J. T. Priestley, Rochester, Minn.; E. Wildbolz, Berne, Switzerland, and V. J. O'Conor, Chicago.—p. 539.

Neurologic Picture of Herniations of Nucleus Pulposus.—Spurling and Grantham present data from 125 consecutive laminectomies performed for intractable pain low in the back and sciatic pain. There were ninety-two cases of frank rupture of the annulus fibrosus with herniation of the nucleus pulposus. In the remainder the final diagnosis was hypertrophy of the ligamentum flavum in eighteen, neoplasm in the lower lumbar canal in four and "negative exploration" in eleven cases. Herniation of the nucleus pulposus occurred at the fifth lumbar interspace in fifty-one, at the fourth in thirty-nine, at the third in one and at both the fourth and the fifth in one. When the herniation occurred at the third lumbar interspace the changes included disability of the lower part of the back (with local tenderness at the third lumbar spine and reduction of lumbar lordosis), positive Lasègue test, positive Naffziger test (producing paresthesias in the fourth and fifth lumbar dermatomes), reduction or absence of the knee jerk with an unchanged ankle jerk, and hypesthesia and paresthesia in the fourth and fifth lumbar dermatomes. When the fourth lumbar interspace was involved, the signs and symptoms were disability of the lower part of the back with stiffness of the lumbar portion of the spine and localized tenderness at the level of the fourth lamina with reduction of lumbar lordosis, positive Lasègue, positive Naffziger with paresthesias involving the fifth lumbar, the first sacral and perhaps the second sacral dermatomes, uninvolved ankle and knee jerks and hypesthesia and paresthesias in the fifth lumbar and first sacral dermatomes. With the herniation at the fifth lumbar interspace the signs and symptoms were disability of the lower part of the back with absence of lumbar lordosis and localized tenderness to pressure over the fifth lumbar vertebra, positive Lasègue, positive Naffziger (producing paresthesias radiating into the first and second sacral dermatomes), diminution or absence of ankle jerk and hypesthesia involving the first and second sacral dermatomes. That these neurologic symptoms and signs are reliable is attested by the fact that during the past eight months the authors successfully removed twenty-six consecutive herniations of the nucleus pulposus without confirmation with iodized oil or other contrast medium. In the same period iodized oil was used in twenty-eight cases for verification of the lesion. The clinical signs in twelve of these cases were sufficiently clearcut to justify surgical exploration without iodized oil, but x-ray verification was demanded. Iodized oil failed to verify the lesion in four cases; in two the clinical picture definitely pointed to herniation at the fifth lumbar interspace, yet the iodized oil study indicated that the lesion was at the fourth lumbar interspace. The accuracy of the clinical observation in both instances was confirmed, whereas the defects observed with iodized oil were explained only by the presence of a hypertrophied ligamentum flavum. The authors feel much safer in subjecting patients to operation when the clinical indications are clearcut than when an iodized oil study is necessary for accurate diagnosis. The neurologic signs and symptoms of herniated nucleus pulposus are not peculiar to this one clinical entity, as neoplasms within the spinal canal or along the course of the sciatic nerve, rectal or pelvic pathologic conditions and diseases of the osseous structures may simulate this clinical picture. The need for complete clinical study of all patients with disability of the lower part of the back and of the leg before contrast myelography or exploration is resorted to is apparent.

Cervical Cord Compression by Herniated Nucleus Pulposus.—Cervical herniations of the nucleus pulposus may produce three different syndromes. The first of these, the syndrome of bilateral pressure, Stookey subdivides into two forms, depending on the size and the precise position of the projection: 1. If the mass is small and is in the midline, bilateral pressure is exerted on the ventral horns of both sides and on both ventral roots, giving rise to bilateral signs referable only to the ventral gray columns, without other evidence of compression. 2. If the mass is larger, the signs are indistinguishable from those of a ventral tumor of the spinal cord. The second syndrome, that of unilateral ventral pressure, due to compression of the ventral horn and ventrolateral columns of one side, consists of focal atrophy and crossed dissociated sensory changes. Unilateral root pressure is characterized by unilateral focal atrophy and focal pain without signs of involvement of the long fiber tracts. In the presence of any one of these syndromes, it is the author's belief that it is wiser to do an exploratory laminectomy than to accept a diagnosis of intrinsic disease of the cord with its implied hopelessness. The so-called ventral extradural cervical chondroma, first recognized as a clinical entity in 1928, is now believed to be not a neoplasm but a portion of the nucleus pulposus protruding through the annulus fibrosus into the vertebral canal. These protruding parts give rise to the foregoing syndromes. The author prefers Taylor's hemilaminectomy as the approach to the herniated portions of the nucleus pulposus in the cervical region.

Protruded Intervertebral Disk.—Macey presents observations on orthopedic and neurologic examinations of 100 cases in which posterior protrusion of an intervertebral disk was of apparent significance in producing symptoms. He feels that this syndrome presents sufficient clinical evidence in the history and the examination to arouse suspicion of a posteriorly protruded disk in practically all cases and that in the majority the condition can be diagnosed on the clinical history and examination alone. However, x-ray examination probably should be carried out on all patients to determine the location of the protrusion or protrusions. In the quiescent period an x-ray examination is necessary to demonstrate a suspected lesion. There are cases in which the results of an x-ray examination are negative but must be considered in deciding whether an exploration should be made. A possible explanation for the intermittence of symptoms is that in some manner a change in the position of the dislodged nucleus beneath the annulus fibrosus takes place and an approximately normal anatomic position results. From the cases observed at operation, it is seen that this could occur by reduction of a protruded nucleus pulposus between the intervertebral bodies, permitting a collapse of the annulus and a release of nerve compression. A sudden unexpected hyperextension at the lower lumbar vertebrae is a significant test in examining these patients. When the result is positive, pain is reproduced over the course of the affected sciatic nerve. The mechanism whereby this occurs is probably a narrowing of the posterior interspace with a sudden relative increase in the posterior bulge, with sudden pressure on the nerve root. Treatment of this lesion consists of a laminectomy and removal of the ligamentum flavum and the disk with the preservation of the articular facets. Cases in which hemilaminectomy and removal of the disk and bone grafting are employed include such conditions as spondylolisthesis, separated neural arch without slipping of the vertebral body, and marked narrowing of the intervertebral space with hypertrophic arthritic changes.

Intraspinal Protrusion of Intervertebral Disks.—Love and Walsh point out that, since the syndrome of protruded intervertebral disk has become established, it has been diag-

nosed not only by the neurologist and orthopedist but by the general practitioner. They believe that intervertebral fibrocartilaginous disks protrude posteriorly into the spinal canal as the result of unusual stress or strain applied to the vertebral column as the result of a single injury or of repeated injuries of varying degrees of severity. In an analysis of 500 consecutive cases in which operation was performed at the Mayo Clinic, 58 per cent of the patients gave a history of a specific injury to the back. Most of these persons had not connected their complaint of backache or sciatic pain with the injury. This is true particularly if there has been a long interim of freedom from pain. A history of intermittence of symptoms was given by 84 per cent. To what this intermittence is due is not known. It serves as a useful criterion in distinguishing between root pain caused by a protruded disk and that caused by an intraspinal neoplasm, which usually is marked by definite progression of symptoms and signs. Protrusion of any intervertebral disk may occur, but it seems to occur more frequently in the lumbar region. In 96 per cent of the 500 cases there were lumbar protrusions. This is an important diagnostic fact, as no lesion can assume much size in the cervical and thoracic regions of the spinal canal without interrupting some nerve pathway, thus calling attention to a compressive lesion; but in the lumbar region a mass may be large before the conduction system is involved. The three neurologic signs which continue to be most helpful in the diagnosis of protrusion of a lumbar disk are Lasègue's sign (positive in 84 per cent of cases), sciatic tenderness (present in 64 per cent) and diminution or absence of the achilles reflex on the side of the pain (60 per cent). The authors are gratified with the results reported by their 500 patients, most of whom had suffered for many years from intractable backache and sciatic pain. There have been only two hospital deaths in the entire series in which operation was performed. Five recurrences were encountered. The authors believe that if there is a recurrence of symptoms due to a protruded intervertebral disk it is most likely due to further protrusion at the site of the original protrusion. Such was the case in the five recurrences.

Delaware State Medical Journal, Wilmington

12: 19-38 (Feb.) 1940

Difficulties in Early Diagnosis of Primary Cancer of Lung. J. T. Bauer, Philadelphia.—p. 19.

Allergy and Its Relationship to Dermatology. J. Miller, Philadelphia.—p. 26.

Journal of Immunology, Baltimore

38: 81-158 (Feb.) 1940

Studies on Relationship of Sex Hormones to Infection: III. Quantitative Study of Increased Resistance to Vaccinial Infection Produced by Estrogenic Hormone and Pseudopregnancy. D. H. Sprunt and Sara McDearman, Durham, N. C.—p. 81.

Spermatocal Antibodies and Fertility: I. Attempt to Induce Temporary Sterility in Female White Mice by Passive Immunization with Spermatocal Antiserums. W. Henle, Gertrude Henle, C. F. Church and Claire Foster, Philadelphia.—p. 97.

Id: II. Attempt to Induce Temporary Sterility in Female Guinea Pigs by Active Immunization Against Spermatocea. W. Henle and Gertrude Henle, Philadelphia.—p. 105.

*Vaccination of Man Against Virus of Equine Encephalomyelitis (Eastern and Western Strains). J. W. Beard, Dorothy Beard and H. Finkelstein, Durham, N. C.—p. 117.

Effects of Injection of Glucose on Experimental Staphylococcic Infection in Mice. I. A. Parfentjev and S. W. Collins Jr., with technical assistance of Margaret Cross, Pearl River, N. Y.—p. 137.

Time Factor in Solubility of Precipitates in Excess of Antigen. W. C. Boyd, Boston.—p. 143.

Construction of Graphs and Tables for Evaluation of Quantitative Complement Fixation Reactions and Reaction Ratios. W. R. Thompson and F. Maltaner, Albany, N. Y.—p. 147.

Vaccination Against Equine Encephalomyelitis Virus.—The Beards and Finkelstein used formolized chick embryo vaccines, effective in horses and other animals, in 100 men and women. The serums of twenty-five were examined before vaccination for the presence of neutralizing antibodies. A single "bivalent" vaccine prepared in a batch of more than 30 liters in the routine way for use in horses was used. It was chosen on the basis of the high titer of virus in the tissue before formolization and its high protective action for guinea pigs. Most of the individuals vaccinated had worked with virus or with virus-diseased animals. Only a few had no history of contact with the virus or the disease. Reactions to the vaccine were variable. Superficial introduction of 1 cc. of material into the deltoid muscle led to immediate smarting and dull pain followed by continuous pain, tenderness, discoloration and slight swelling. Injection of 1 cc. of vaccine at a depth of from 1 to 1½ inches in the gluteal muscle, well away from the sciatic nerve, was followed, usually within a few minutes, by dull, sometimes intense, pain that diminished and disappeared within half an hour. The general impression gained was that, though the procedure was disagreeable, the local results were temporary and inconsequential. General reactions were experienced by a few. Weakness, slight nausea and cramping in both lower extremities for the first day were experienced infrequently by the women. Only one man complained of more than temporary pain. The results of the serum studies showed a high response in the production of neutralizing antibodies. Response to the Eastern strain antigen appeared in some instances within seven days after the first injection, while that to the Western strain was pronounced within this period. In all cases except one, the final neutralizing titer of the serums after twenty-one days for the Eastern strain was between 100 and 10,000 mouse infectious units, and similar titers with no exceptions were observed with the Western strain. With the Eastern strain the content of antibodies was nearly as high after fourteen as after twenty-one days. A more rapid and definite response to Western strain antigen was shown by the high neutralizing titer developing in seven days. A single dose of 1 cc. seemed to be as effective as larger amounts. The presence of neutralizing antibodies in certain of the serums before vaccination has been interpreted as due to previous subclinical infections with one or the other or both strains of virus. The presence of antibodies against one strain did not interfere with the response to the antigen of the other strain. The antibody titer present before vaccination was greatly increased by the vaccine. In no instance was there evidence of decrease. The results demonstrate that vaccination of people frequently exposed to the virus in the laboratory and in the field is indicated.

Journal Industrial Hygiene & Toxicology, Baltimore

22: 89-110 (March) 1940

Determination of Thoron Content of Air and Its Bearing on Lung Cancer Hazards in Industry. R. D. Evans and C. Goodman, Cambridge, Mass.—p. 89.

Age and Lead Content of Certain Human Bones: Compilation and Statistical Analysis of Recently Published Data. H. F. Morris, Washington, D. C.—p. 100.

Experimental Radiologic Observations on Action of Electrical Current on Respiratory and Circulatory Organs: I. Respiratory Organs. A. W. Greenberg, Leningrad, Soviet Union.—p. 104.

Kentucky Medical Journal, Bowling Green

38: 95-138 (March) 1940

Carcinoma of Colon. D. P. Hall, Louisville.—p. 96.

Modern Therapy of Common Blood Stream Infections. H. E. Richey, Louisville.—p. 102.

Relations of Ocular Conditions to General Practice. D. L. Salmon, Madisonville.—p. 110.

Cancer of Breast: Description of Rodman Operation. D. Guthrie, Sayre, Pa.—p. 113.

Syphilis Control in Kentucky by Means of a Mechanical System of Morbidity Reporting. J. R. Pate, Louisville.—p. 121.

Management of Skin Cancer. J. Love, Louisville.—p. 126.

Michigan State Medical Society Journal, Lansing

39: 77-156 (Feb.) 1940

Breast Cancer: Surgical Treatment. B. R. Shore, New York.—p. 93.

Syphilis in Industry. G. Van Rhee, Detroit.—p. 98.

Otolaryngology: Some Practical Points in Diagnosis and Treatment. H. M. Gondyear, Cincinnati.—p. 101.

Improved Needle for the Injection of Internal Hemorrhoids. C. L. A. Odén, Muskegon.—p. 104.

Pyuria: Its Diagnostic Significance. B. C. Corbus, Evanston, Ill.—p. 105.

Endocrinology: Its Application to Human Needs. J. R. Goodall, Montreal.—p. 109.

Schizophrenia: Neurologic Signs. W. A. Muehlig, Ann Arbor.—p. 116.

Nebraska State Medical Journal, Lincoln

25: 81-120 (March) 1940

Observation from 1½ to 5 Years Following Anterior Pituitary-like Sex-Hormone (Antuitrin S) Therapy. R. L. Schaefer and D. K. Kitchen, Detroit.—p. 81.

Brief Analysis of Maternal Mortality in Nebraska 1928-1937. R. H. Loder, Lincoln.—p. 86.

Panel Discussion on Sulfanilamide and Its Derivatives. L. T. Hall, M. F. Gunderson, Helen Wyandt, E. Davis, W. H. Stokes, D. Findley and D. Judd, Omaha.—p. 89.

Revaluation of Our Knowledge of Intracranial Hemorrhage of the Newborn. H. M. Jahr, Omaha.—p. 100.

New England Journal of Medicine, Boston

223: 289-334 (Feb. 22) 1940

*Subphrenic Abscess: Report of 111 Consecutive Operative Cases. H. H. Faxon, Boston.—p. 289.
Heberden's Nodes: Incidence of Hypertrophic Arthritis of Fingers. R. M. Stecher, Cleveland.—p. 300.
Delinquency. D. A. Thom, Boston.—p. 308.
The Vitamins. A. P. Meiklejohn, Boston.—p. 313.

Subphrenic Abscess.—According to Faxon from 1900 to 1938 a diagnosis of an infectious subphrenic process has been made in 175 cases at the Massachusetts General Hospital. In twenty-two, undrained abscesses were discovered at necropsy. Spontaneous drainage was encountered in four. In thirty-two the clinical course, physical signs and x-ray evidence suggested a mild irritative process beneath the diaphragm. All these patients recovered without surgical operation. Six patients, on whom operation was performed but without pus being encountered, were presumably suffering from a similar nonsuppurative type of lesion. The age incidence and sex distribution in the 111 surgically treated cases indicate an increase in the incidence of subphrenic abscess from the first to the fifth decade of life and that it is more frequent in men (68 per cent) than in women. Although a certain number of subphrenic infections gain access to the subdiaphragmatic area by way of the lymphatics and the blood stream, the vast majority originate from an extension of intraperitoneal sepsis. Infection originating in the appendix is the commonest source of subphrenic abscess formation. Second in importance as the primary source of infection were lesions of the stomach and the duodenum, while those in the liver and bile passages ranked third. The presence of a subphrenic abscess should be suspected in any case in which a persistent unexplained fever is associated with a history of recent intraperitoneal sepsis. In 87 per cent of the reviewed cases the abscesses were on the right side, with the right posterosuperior space most frequently involved. It is at times difficult to elicit convincing evidence from pressure over the twelfth rib posteriorly or the lower costal margin anteriorly in the early stages of development of an abscess. Repeated examinations will eventually show tenderness to be present over an involved space in practically every case. Granted the diagnosis of a collection of pus beneath the diaphragm, there is complete unanimity of opinion that the treatment lies in prompt drainage of the area. Faxon believes that the transthoracic approach increases the risk of contamination of the pleural cavity inherent in this type of drainage. The advocates of the retroperitoneal type of approach contend that this method at a single operative step gives the abscess adequate dependent drainage with the smallest chance of contaminating uninvolved surfaces. The author argues that both the theoretical and the statistical evidence favor the retroperitoneal type of operation as the procedure of choice. Contamination of the pleural or peritoneal cavities at the time of operation more than doubles the mortality rate. Contamination of the pleural or peritoneal cavities occurs far more frequently with the transthoracic and transperitoneal types of approach than it does with the retroperitoneal operation.

North Carolina Medical Journal, Winston-Salem

1: 65-124 (Feb.) 1940

The Making of a Clinician. D. Riesman, Philadelphia.—p. 65.
Vaginal Ureterolithotomy: Review of Reported Cases. D. B. Cobb, Goldsboro.—p. 70.
Ainhum Treated by Lumbar Sympathetic Ganglionectomy: Case. Complete Bibliography. R. B. McKnight, Charlotte.—p. 76.
*Cod Liver Oil Treatment of Burns and Wounds. P. C. Hardin, Monroe. —p. 82.
Malaria Studies and Investigations in North Carolina. C. M. White, Raleigh, and L. L. Parks, Tarboro.—p. 92.
*Low Back Pain and Sciatica, with Special Reference to Rupture of Intervertebral Disk. B. Woodhall, R. B. Raney and W. W. Vaughan, Durham.—p. 94.
Relationship of Gynecology and Urology. E. V. Benbow, Winston-Salem.—p. 101.
Present Day Diagnosis and Treatment of Chancroidal Infection. W. L. Thomas, Durham.—p. 104.
Role of Pectin in Diarrhea. G. W. Kutscher Jr., Asheville.—p. 107.

Cod Liver Oil for Burns and Wounds.—Hardin reports the results of cod liver oil ointment therapy in seventy-five selected clean and infected wounds and nine fresh major burns. He states that as a rule more tissue is saved, infection is better controlled, tissue regeneration is accelerated, less scarring occurs, pain is more completely eliminated, hospitalization is made shorter, and a better functional result is achieved by the use of cod liver oil-petrolatum ointment than with other methods of therapy. The disadvantages are few and relatively unimportant. In treating extensive burns or ulcerations, large amounts of the ointment are needed and the expense is considerable. But the additional cost is more than compensated by the more rapid healing and quicker return to health. The disagreeable odor of fish oil, though occasionally objectionable, has not proved seriously unpleasant to the patient. This is easily controlled by sprinkling a few drops of turpentine on the dressings. Rancidity seldom occurs, since the ointment is self sterilizing and even rancid oil does not harm the wound. No ill effects have been reported from hypervitaminosis. Irritation and maceration of the skin do not occur.

Low Back Pain, Sciatica and Rupture of Intervertebral Disk.—Woodhall and his associates point out that the numerically small group of individuals with complaints of low back pain and sciatica in whom orthopedic disturbances cannot be demonstrated and in whom the usual methods of treatment are ineffectual includes patients with actual compression of the roots of the cauda equina from a ruptured intervertebral disk, hypertrophy of the ligamentum flavum, tumor of the cauda equina, arachnoiditis, intrinsic lesion of the cauda equina (radiculitis caused by trauma, infection or a chemical agent) and malingerers or patients who have developed a traumatic psychosis with their somatic complaint referred to the lumbar spine. The authors record their experience with thirty-nine cases belonging to this group in which x-ray studies with iodized poppyseed oil as the opaque medium were done. In twenty-five the clinical syndrome of a ruptured intervertebral disk was recognized and treated as such.

Oklahoma State Medical Assn. Journal, Oklahoma City

33: 1-58 (Feb.) 1940

Petrositis. T. G. Wails, Oklahoma City.—p. 1.
Gout (Metabolic Arthritis). E. Goldfain, Oklahoma City.—p. 3.
Chemotherapy of Infectious Diseases. L. F. Barker, Baltimore.—p. 6.
Diagnosis and Treatment of Acute Intestinal Obstruction. G. E. Stanbro, Oklahoma City.—p. 11.
Technic of Refraction. H. F. Vandever, Enid.—p. 15.

Southern Surgeon, Atlanta, Ga.

9: 73-148 (Feb.) 1940

Factors Influencing Mortality of Perforated Peptic Ulcer. T. C. Davison and F. F. Rudder, Atlanta, Ga.—p. 73.
*Operation for Relief of Epilepsy Following Certain Traumatic and Inflammatory Lesions of Brain. J. M. Meredith, University, Va.—p. 86.
Factors in Mortality of Thyroid Disease in Nonendemic Area: Analysis of 817 Consecutive Surgical Cases and 103 Consecutive Surgical and Nonsurgical Deaths, with Note on Value of Quick Test of Liver Function in Estimation of Hepatic Damage. F. F. Boyce, New Orleans.—p. 96.
Primary Ovarian Pregnancy: Review of Literature and Case Report. P. B. Russell Jr. and W. T. Black Jr., Memphis, Tenn.—p. 114.
Bone Tumors. G. W. Jones, Hines, Ill.—p. 122.

Surgical Relief for Epilepsy Following Trauma.—Meredith devised an operation for the relief of epilepsy which follows cerebral trauma resulting in obliteration of the basilar cisterns. The requirements for success are (1) that a definite internal (communicating) hydrocephalus be present (as demonstrated by encephalography) with (2) little or no air in the subarachnoid spaces overlying the cerebral hemispheres or in the basilar cisterns. The operation consists of a transcortical incision and large stoma formation into the lateral ventricle through a relatively unimportant portion of the less dominant cerebral hemisphere, together with excision of the choroid plexus in that ventricle; this results in short circuiting of the fluid around the obstructed basilar cisterns and a reduction in the total amount of fluid formed. Convulsions have not recurred up to twenty-three months after operation in the author's case, although phenobarbital and other anticonvulsive drugs were discontinued one year after operation. Before the surgical operation the patient was having several severe convulsions every month, in spite of dehydration and phenobarbital therapy. The author states that an encephalographic picture, as in his case, is occasionally seen in cases of epilepsy either post-traumatically or after an inflammatory lesion of the brain. He urges that further use be made of the operative procedure described in an effort to combat the devastating effects of convulsive disorders.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

21:1-66 (Feb.) 1940

Quantitative Investigation of Precipitin Reactions of Proteins Treated with Phenylisocyanate and Formaldehyde. A. Kleczkowski.—p. 1.
Chemotherapeutic Experiments on Pleuropneumonia-like Organisms in Rodents. G. M. Findlay, R. D. Mackenzie and F. O. MacCallum.—p. 13.
New Blood Test and Its Application to Microdetermination of Hemoglobin. J. F. Barrett.—p. 22.
Nutrition of Streptococcus Haemolyticus: Growth in Chemically Defined Mixture, Need for Vitamin B6. H. McIlwain.—p. 25.
Mode of Action of Sulfanilamide, with Special Reference to Bacterial Growth Stimulating Factor (P Factor) Obtained from Brucella Abortus and Other Bacteria. H. N. Green.—p. 38.
Augmentation of Action of Anthracite and Other Dusts by Dead Tubercle Bacilli. S. L. Cummins.—p. 64.

British Journal of Tuberculosis, London

34:1-48 (Jan.) 1940

Tuberculosis Association of India. C. Primodt-Möller.—p. 5.
*Internal Pneumonolysis: Report on 200 Cases. F. L. Wollaston.—p. 13.
Choice of Partial Collapse Operations in Pulmonary Tuberculosis. A. L. D'Abreu.—p. 27.
Thrombosis of Superior Vena Cava. E. M. Buzzard.—p. 39.

Internal Pneumonolysis.—Wollaston presents an analysis of 200 cases in which internal pneumonolysis was done as a routine part of the treatment of pulmonary tuberculosis by artificial pneumothorax. The object was to obtain a satisfactory collapse with either a selective roentgenologic collapse giving complete relaxation to the diseased area of the lung or a complete collapse when this was indicated by the extent of the disease. In assessing the value of operation, the classification of Hjaltested and Torning has been followed, with slight modification, the degree of collapse being indicated by A and B. A1 included all cases in which the lung was free to the level of the aortic knuckle and in which either selective or complete collapse was maintained; A2 included the cases in which a strip of lung was adherent along the mediastinum up to, but not extending over, the dome of the pleura, and in which the collapse of the lung was selective or complete; B1 included cases in which the apex remained adherent to the dome of the chest but the collapse was otherwise clinically and roentgenologically satisfactory and no cavity was visible, while B2 included all cases in which the cavity remained or lateral adhesions were still present. Before operation all cases came into group B, the majority presenting a cavity and positive sputum (B2). On discharge, 86 per cent were classified in group A. Thus 80 per cent of these patients should be alive and well, according to Hjaltested and Torning, five years after the termination of their pneumothorax, whereas if no operation had been performed 80 per cent would have been dead. Comparing all pneumothorax patients discharged in 1934, none of whom had had their adhesions divided, with all patients discharged in 1938, it was found that in 1934 there were seventeen (25.8 per cent) selective collapse cases, while in 1938 there were fifty (58.8 per cent). Of the cases under review, there was a positive sputum before operation in 157 and in only twenty on discharge. In the author's opinion the optimal time for dividing adhesions is from six to eight weeks after the induction of the pneumothorax. Of the 200 cases an A1 collapse was obtained in 118, an A2 collapse in fifty-four, a B1 in twenty and a B2 in eight. Of 185 cases presenting a cavity before the operation only nineteen presented a cavity on discharge. The author believes that by not making use of all the means at one's disposal the fullest benefit from pneumothorax cannot be expected. Once it has been decided that pneumothorax is the best treatment in a case, selective collapse and relaxation of the diseased area of the lung should be aimed at until it has been proved unattainable. Since adhesions may cause trouble when the artificial pneumothorax is abandoned, they should be divided unless the division is so difficult as to become dangerous. When symptoms of incomplete collapse are present, the division of adhesions becomes essential as being the only alternative to the abandonment of the artificial pneumothorax and the undertaking of other and more drastic forms of collapse therapy. Selective collapse can be attained in a reasonable proportion of cases, with a minimum of danger and discomfort to the patient and with no greater incidence of pleural effusion and empyema than that expected to occur in pneumothorax cases. The value of complete or selective collapse is such that every adhesion should be divided, provided it can be done with reasonable safety.

Indian Medical Gazette, Calcutta

74:719-782 (Dec.) 1939. Partial Index

Further Observations on Protamine Zinc Insulin in Clinical Diabetes. J. P. Bose.—p. 719.
*Naphthalene Poisoning. N. R. Konar, H. K. Roy and M. N. De.—p. 723.
Cardiovascular Syphilis and Cerebral Symptoms. P. G. Gollerkeri.—p. 725.
Yaws in Chatra Subdivision of Hazaribagh District, Chotanagpur. G. N. Sinha.—p. 728.
Outbreak of Epidemic Dropsy in a Closed Community. C. L. Pasricha, S. Lal, K. S. Malik and P. K. Biswas.—p. 733.
Aschheim-Zondek and Friedman Tests in Diagnosis of the Life and Death of a Fetus. C. L. Pasricha, S. Lal and K. Banerjee.—p. 736.
Simple Technic of Giving Intravenous Quinine with Saline. R. K. De.—p. 740.

Naphthalene Poisoning.—Konar and his colleagues report the second case of naphthalene poisoning to occur in India. The remarkable features of the case were deepening coma, severe jaundice, fever, rapidly developing anemia, hyperthermia and patchy hepatic necrosis, as revealed by the necropsy. Such features have not been frequently noticed in the previously reported cases. The authors have found no mention of hyperthermia, hemiplegia and marked anemia in the previously recorded cases. The marked degree of anemia which developed so rapidly (death occurred three days after the ingestion of the naphthalene) was possibly due to acute hemolysis, although in this case there was no hemoglobinuria. This hemolysis enhanced the jaundice primarily caused by hepatic necrosis. Hyperthermia might be explained by the cholemia consequent to hepatic necrosis, like the hyperthermia encountered in cases of acute yellow atrophy of the liver. It is also possible that, in the metabolism of naphthalene, naphthylamine (an amino derivative) was formed and was responsible for the fever. Naphthylamine has been used by laboratory workers for producing experimental hyperthermia.

Lancet, London

1:303-348 (Feb. 17) 1940

Frostbite and Trench Foot. R. Greene.—p. 303.
Rickettsia Diseases of Malaya: Identity of Tsutsugamushi and Rural Typhus. R. Lewthwaite and S. R. Savoor.—p. 303.
*Treatment of Pneumonia with Sulfapyridine, With and Without Specific Serum. C. S. D. Dun, R. W. Luxton, H. R. Donald, W. A. Ramsay, D. W. Macartney, G. S. Smith and C. H. Adderley.—p. 311.
Hyperventilation Syndrome. W. Sargant.—p. 314.
Hematemesis and the War. G. Melton.—p. 316.

Treatment of Pneumonia with Sulfapyridine.—Dun and his co-workers report a controlled investigation of cases of lobar pneumonia admitted to Crumpsall Hospital, Manchester, making full use of x-ray and laboratory facilities. All pneumonia cases have been included irrespective of the condition on admission or the stage of the disease. The first and every subsequent third case were treated as controls. Every alternate type I case was treated with sulfapyridine alone and every other type I case (other than controls) with the drug plus the specific serum. Similarly, apart from controls, every alternate type II case was treated with sulfapyridine alone and every other type II case with the drug plus the specific serum. All other types, except controls, were treated with sulfapyridine alone. The patients were nursed in special wards, receiving the same nursing attention and the ordinary pneumonia routine: antiphlogistine, expectorant mixtures, sedatives and stimulants. Of the 234 cases of lobar pneumonia treated, seventy-eight were controls giving twenty-one deaths; 119 were treated with sulfapyridine alone, giving a case mortality of 6.7 per cent, and thirty-seven cases of either type I or type II treated with sulfapyridine plus specific serum, with three deaths. The case mortality of patients aged 55 or over was more than halved by treatment with sulfapyridine, and a similar reduction was noted in the smaller number of type III cases. The authors were impressed by the favorable outlook in type I and type II pneumonias treated with sulfapyridine alone, one death taking place in forty-nine cases. The case mortality in type I and type II was slightly better in the cases treated with sulfapyridine alone than in those treated

with the drug plus serum, but in view of the comparatively small numbers it was felt inadvisable to draw conclusions. Of fifteen control patients with positive blood cultures (and type of pneumococcus) nine died, whereas of sixteen patients with positive blood cultures treated with sulfapyridine only four died. A striking feature was the considerably reduced case mortality in type I and type II with positive blood cultures, as compared with similar control cases, of patients treated with sulfapyridine alone and with sulfapyridine plus serum. Complications were fewer among the patients treated with sulfapyridine and in those given the drug plus serum than in the controls.

Practitioner, London

144: 109-212 (Feb.) 1940

Treatment of Simple Goiter. T. G. Moorhead.—p. 109.
Medical Treatment of Thyrotoxicosis. C. Bramwell.—p. 117.
Surgical Treatment of Toxic Goiter. C. A. Joll.—p. 124.
Tumors of Adrenal Gland. L. R. Broster.—p. 135.
The Pituitary Gland. E. P. Sharpey-Schafer.—p. 143.
Use of Male Sex Hormone in Treatment. P. M. F. Bishop.—p. 150.
Disorders of Female Sex Glands and Their Treatment. A. J. Wrigley. —p. 156.
War Time Diseases of Skin. H. MacCormac.—p. 165.
Some Ophthalmic Problems in War Time. Ida Mann.—p. 174.
Points of Prognostic Value in Bronchial Asthma. E. M. Fraenkel.—p. 181.
Modern Therapeutics: VIII. Sedatives and Analgesics. W. J. Dilling. —p. 189.

Quarterly Journal of Medicine, Oxford

9: 1-128 (Jan.) 1940

Tuberose Sclerosis, Rheostosis and Neurofibromatosis. G. S. Hall. —p. 1.
Intravenous Dextrose Tolerance Test. R. E. Tunbridge and E. C. Allibone.—p. 11.
*Acute Nephritis in Childhood, with Special Reference to Diagnosis of Focal Nephritis. W. W. Payne and R. S. Illingworth.—p. 37.
Atypical Manifestations of Leukemia. M. M. Wintrobe and D. M. Mitchell.—p. 67.
Renal Changes in Alkalosis. B. M. Nicol.—p. 91.
*Serum Choline Esterase in Jaundice and Diseases of Liver. B. McArdle. —p. 107.

Acute Nephritis in Childhood.—Payne and Illingworth observed 301 cases of nephritis in children in the acute and sixty-four in subsequent stages. As edema is usually accepted as the chief distinguishing feature of the acute stage, the cases were divided into three groups: no edema, no edema other than puffiness of the eyelids and definite edema. No difference between the three groups could be found to lie in the etiologic factors, age and sex incidence or causative infection. In symptomatology there was no appreciable difference between the groups. The incidence of vomiting, abdominal pain and frequency was high. Many children had no symptoms. In the majority of cases it was not possible to estimate the time interval between infection and nephritis, but in those few in which it was possible there was no difference in the three groups. The edematous cases commence at the height of the infection quite as frequently as the nonedematous. There appeared to be no difference in the frequency with which nitrogen retention occurs in any of the three groups. The rise in blood urea in the majority of cases was transient. It is suggested that hypertension and oliguria in the acute stage are not of value in distinguishing the two types of nephritis. The occurrence of exacerbation of the nephritis as the result of tonsillectomy was of no diagnostic value. The prognosis in the three groups was equally serious, the majority being in the latent stage when reexamined from one to twelve years after the acute attack. A high incidence of hypertension in the latent stage, in some cases in the absence of urinary abnormality, was observed. The incidence of this hypertension increased markedly with the duration of the disease. Having found that the presence or absence of edema is a useless criterion for the distinction of the two types, the authors applied other criteria used for the diagnosis of focal nephritis and found that they were similarly useless for distinguishing the two types of the disease. They conclude that acute focal nephritis is not a clinical entity.

Serum Choline Esterase in Jaundice and Diseases of Liver.—McArdle recognized a relationship between low choline esterase readings and liver disease in 270 subjects. At the same time no clinical signs or symptoms that could be attributed to a fall in the activity of the enzyme have been observed, and the association remains unexplained. The author continued the investigation hoping that the estimation might prove of value in the differentiation of toxic and obstructive jaundice and as a test of liver function. The method used was that of Jones and Tod (1935). In forty normal adults the range of choline esterase in the serum was from 51 to 121 units, with a mean of 78 units. For twenty children (from 7 to 15 years old) the values varied from 71 to 166 units, the mean being 105 units. In diseases of the liver the values were much lower. Of the seventy-one cases examined, the values of 79 per cent were below 50 units, the range being from 10 to 70 and the mean 36 units. This difference from normal adults is statistically significant. Eighty-two patients with miscellaneous diseases had esterase values between 13 and 138, with a mean of 71 units. Twenty had values below 50 units, and in many of them there were strong clinical indications of hepatic damage. The initial figure for choline esterase was 50 units or above in twenty-one (87.5 per cent) of the twenty-four instances of obstructive jaundice, while in jaundice of hepatic origin it was below 50 units in thirty-three (87 per cent) of the thirty-eight cases. Improvement or impairment of hepatic function was accompanied by a rise or fall respectively in choline esterase. The author suggests that the determination of the choline esterase in the serum might be employed usefully as a measure of hepatic function and as a test in differentiating jaundice of hepatic and obstructive origin. A value below 50 units indicates that the liver is damaged. Normal figures in hyperthyroidism and possibly in diabetes may not necessarily mean a healthy liver. The test compares favorably with other tests used in the diagnosis of jaundice and disease of the liver. As with all other functional tests, it is likely to be of most value when used in conjunction with clinical observations.

Tohoku Journal of Experimental Medicine, Sendai

37: 373-490 (Jan.) 1940. Partial Index

Toxicity of Milk of Pregnant Mothers and Its Arakawa's Reaction. M. Yamagishi and S. Sato.—p. 373.
Relation of Diastase Content in Mother's Urine and Arakawa's Reaction of Mother's Milk. S. Sato.—p. 392.
Change of Number and Size of Blood Platelets in Breast Fed Infants and Intensity of Arakawa's Reaction of Their Mothers on Vitamin B Administration. M. Shindo.—p. 410.
*Studies on Types of Tubercle Bacilli Cultured from Tuberculous Kidneys. C. Suzuki.—p. 425.
Mechanism of Cathartic Action of Calomel. S. Kawada.—p. 466.

Types of Bacilli in Tuberculous Kidneys.—Suzuki attempted to investigate the question of chronic renal tuberculosis with its diversity in the clinical course and its varying anatomic changes in the renal parenchyma, always being caused by the same type of tubercle bacillus, the human type, the possibility of the bovine type and the gallinaceous type concurring with the human type, as they do in other forms of tuberculosis, and the variability in the virulence of the human type of tubercle bacillus. He cultured tubercle bacilli from the pus of 101 tuberculous kidneys, using the Petragnani medium and 4 per cent glycerin bouillon. The growth was always rapid and eugonic and no essential difference could be seen between the strains. In inoculation tests on guinea pigs, the 101 strains of tubercle bacilli showed a considerable pathogenicity. The animals all died as the result of a generalized tuberculosis. However, inoculation of the 101 strains of tubercle bacilli into rabbits, which were observed for three months, never resulted in a death from generalized tuberculosis. A small number of strains produced only a local process at the site of inoculation, but in the majority of rabbits there developed in addition to the local process at the site of inoculation a mild or severe tuberculous process in the lungs and occasionally also in the liver and kidneys. Strains cultured from tuberculous processes at the apex of the papilla or from the terminal stage of the caseocavernous form had a comparatively low pathogenicity in rabbits, but strains from the florid stages of caseocavernous renal tuberculosis, from tuberculous pyonephrosis and particularly those from the coarse nodular form showed a high pathogenicity in rabbits. The author's own method of agglutinatory differentiation between the human and bovine types of tubercle bacilli revealed that the 101 strains obtained from tuberculous kidneys belonged to the human type.

Brussels-Médical, Paris

20: 427-447 (Jan. 28) 1940

National Homage of Royal Academy of Medicine of Belgium to Prof. C. Heymans.—p. 427.
*Hematologic Control of Intoxications by Volatile Hydrocarbons. A. Langelez, G. Peremans and H. Bastenier.—p. 430.

Intoxications by Volatile Hydrocarbons.—Langelez and his associates point out that the increasing use of volatile hydrocarbons for various industrial purposes has led to the manifestation of numerous cases of poisoning. They review the cases that have been observed in Belgium during the years 1932-1938. Eleven of these terminated in death, while in sixteen disablement of several years' duration was the result. Nearly all these cases have been attributed to the action of "benzol," a term which the authors restrict to a product obtained by distillation of coal, in contradistinction to benzine, a distillate from petroleum. In addition to subjective and objective symptoms of "benzolism" the intoxication causes especially blood changes. 1. There are cases characterized by alterations of the aplastic type involving in various degree the diverse elements of the blood (erythrocytes, myeloid and lymphoid leukocytes and the thrombocytes). All the elements of the red blood are diminished and neutropenia exists. These cases reproduce the clinical aspects of aleukia haemorrhagica, of total aplastic myelopathy or of panmyelophthisis. 2. So-called pseudo-aplastic cases present the clinical symptoms of the aforementioned cases but develop more slowly. 3. Cases with atypical aplastic anemia are seen, with hypertrophy and myeloid metaplasia, of the leukemic type of reaction. 4. There are cases of chronic or acute leukemia. These different clinical types indicate that "benzol" of coal is especially a toxin of the hematopoietic organs. Aside from the destructive action, the toxin may lead to reparative hyperplastic processes. In recent years poisoning with this substance has become rare as the result of governmental restriction of the employment of "benzol" of coal. Nevertheless variable quantities of "benzol" of coal are usually added to the products of petroleum. The authors investigated the workers who handle the benzine-benzol mixtures for symptoms of "benzolism." A study of the blood of thirty-two workers demonstrated that the inhalation of vapors of "benzol" frequently gave rise to signs of intoxication and especially to grave alterations in the diverse elements of the blood. Investigations on twenty workers whose occupations had brought them in contact with the vapors of benzine of petroleum demonstrated that benzine of petroleum likewise exerts a toxic action, particularly on the erythrocytes. Fourteen of the twenty subjects who had been exposed only to benzine of petroleum presented anemia of considerable severity. The authors stress the necessity of complete removal of the vapors by suitable ventilation and by education of the workers.

Revue Méd.-Chir. des Maladies du Foie, Paris

14: 289-370 (Sept.-Oct.) 1939

*Esters of Cholesterol in Hepatic Insufficiency. N. Fiessinger and M. Gorski.—p. 290.
*Quick's Hippuric Acid Test of Hepatic Insufficiency. N. Fiessinger and R. F. Minoli.—p. 303.
Nicotinic Amide in Blood in Course of Hepatic Diseases. M. Albeaux-Fernet.—p. 323.
Errors of Functional Exploration of Liver by Means of Fractionated Galactosuric Concentration Test. N. Fiessinger, H. Walter, M. Gaultier, and J.-J. Welti.—p. 327.
Porphyrinuria in Patients with Hepatic Disease. N. Fiessinger and A. Gajdos.—p. 348.
Plasmatic Concentrations of Bengal Rose Evaluated with Ionocolorimeter. K. Agapeyeva.—p. 363.

Cholesterol Esters in Hepatic Insufficiency.—Fiessinger and Gorski point out that a false conception has been maintained regarding the role of cholesterol in hepatic insufficiency, namely that its increase indicates hepatic insufficiency. In recent years attention has been drawn to cholesterol esters. It has been demonstrated that cholesterol exists in the organism in two forms: free and esterified. It seems that the esterification of cholesterol is effected in the liver by an esterase capable of decomposing the cholesterolic esters as well as of esterifying the cholesterols. Normally the total cholesterol content of the serum is 1.6 Gm.; that is, 1 Gm. of esterified cholesterol and 0.6 Gm. of free cholesterol. Since Thannhauser, the majority of investigators have admitted that in grave hepatic insufficiency the esterified cholesterol is reduced more rapidly and more noticeably than is the total cholesterol. The authors investigated the problem in various pathologic conditions, such as benign icterus, cirrhosis, grave icterus, hepatic cancer and hepatitis. They concluded that cholesterol occurs as a reactive lipoid in association with a declining infection or a subsiding intoxication. It is a proof and not the manifestation of the morbid process, but a proof of a favorable reaction. The greatest portion of this cholesterol is in the state of an ester. If this cholesterol is largely of endocrine origin, as it appears to have been demonstrated, its esterification is especially deficient in the hepatic function. This is the reason why in grave involvement of the liver (fatty degeneration) the esterified portion undergoes a considerable decrease more marked than that of the free cholesterol. This may be due to a deficiency of material, oleic, palmitic and stearic acids, or to a deficiency of the ferment of synthesis. The latter interpretation seems the more probable. Should this prove to be the reversive action of the hepatic esterase, the grave hepatic insufficiency could be considered at the same time as an inhibiter of the cholesterologenesis and of the esterase of the esters of cholesterol.

Hippuric Acid Test of Hepatic Insufficiency.—Fiessinger and Minoli report their experiences with the test in normal subjects and in patients with hepatic and other disorders. They found that elimination of hippuric acid in urine after the ingestion of sodium benzoate constitutes an excellent test for the functional study of the liver and for the detection of hepatic insufficiency. The phenomenon is a complex method of conjugation of exogenic benzoic acid with endogenic aminoacetic acid. This conjugation is accomplished in the liver, especially under the influence of a hippurase. Evaluating the results in normal subjects, the authors state that the quantity of hippuric acid eliminated during the four hours following ingestion of 6 Gm. of sodium benzoate varied between 2.19 and 3.13 Gm. These figures are lower than those obtained by other investigators. Tests on patients with benign catarrhal icterus revealed that the total elimination of hippuric acid varied between 1.57 and 2.13 Gm. and that a retardation was noticeable in the elimination. In compensated cirrhoses the hippuric acid elimination was reduced; the figures varied between 1.26 and 0.76 Gm.; however, in decompensated cirrhoses the figures were as low as 0.61 and even 0.31 Gm. The reduction was less pronounced in the course of a melanosarcoma of the liver and in alcoholic polyneuritis. In diseases not associated with severe hepatic insufficiency, the urinary elimination of hippuric acid is almost normal. Thus, in albuminuric nephritis without azotemia and in goiter with mild hyperthyroidism the urinary discharge of hippuric acid was normal. Disregarding the sources of error which arise from inadequate digestive absorption or from deficient renal elimination, the reduction of induced hippuria expresses either (1) the incapacity of the liver to fix benzoic acid during the passage of the blood or (2) the considerable deficit of aminoacetic acid reserves in severe hepatic insufficiency or (3) the diminution of the activity of the hepatic hippurase or the existence of a cause which impedes its action.

Schweizerische medizinische Wochenschrift, Basel

70: 1-24 (Jan. 6) 1940. Partial Index

*Leukemia and Tumors. M. Askanazy.—p.1.
Benign Spontaneous Pneumothorax, Tuberculous Spontaneous Pneumothorax and Spontaneous Hemopneumothorax. M. Castex and E. S. Mazzei.—p. 6.
Hemodynamic and Excitomotor Cardiac Insufficiency. W. Löeffler and M. Kartagener.—p. 10.

70: 25-48 (Jan. 13) 1940

Clinical and Pathologic Aspects of Cutaneous Hemorrhages. M. A. Schoch.—p. 25.
*Leukemia and Tumors. M. Askanazy.—p. 1.
Comparative Investigations on Enzymatic Hydrolysis of Acetyl Anemia and Acetylcholine. H. Birkhäuser and H. Süllmann.—p. 34.
Relations of Ascorbic Acid to Epinephrine. P. Marquardt.—p. 36.

Leukemia and Tumors.—Askanazy examined the characteristics of leukemia with regard to the alternative hyperplasia and neoplasia and compared it with that of true tumors. He demonstrated that the essentials of leukemic proliferations are not identical with those of hyperplastic malignant proliferations either in etiology, morphology or function. However, leukosis shows a close relationship to tumor formation not only as

regards the etiologic complex of the general predisposition and the exogenic and endogenic factors in the cells but also with regard to the morphology in the form of an unrestricted growth with manifold atypias, with enlargement of nuclei and atypical mitosis. It has not been demonstrated that the leukemic metastases develop differently from those of the malignant tumors. In their functional nature leukoses and neoplasms are similar in that the fertility of their cells becomes enormously increased without destruction of the inherited function of the cell. The author concludes that the leukemias are tumor-like processes. He thinks that the fact that normal medullary cells enter the blood without giving rise to the formation of tissue explains some differences between leukosis and neoplasm. The frequently observed association of leukemias with tumor formation of the corresponding cell type become understandable in view of this fact. A final solution of the problem will be possible only after a better understanding of the etiologic complexes of both diseases.

Ateneo Parmense, Parma

11: 433-564 (Nov.-Dec.) 1939. Partial Index

*Antiserum Treatment of Peritonites. E. Ponzi.—p. 433.
Ide's Reaction for Syphilis. G. Pavarani.—p. 527.

Antiserum Therapy of Peritonitis.—Ponzi administered antiserum both for the prevention and for the treatment of peritonitis in fourteen cases. The series contained patients who had been operated on and those treated conservatively. They presented acute appendicitis, intestinal or suppurative gynecologic disease, peritonitis complicating the conditions mentioned and septic abortion. The majority of the patients entered the hospital in a grave toxic state. The author employed Behring antiserum containing 1,000 international antitoxin units against Bacillus perfringens and 1,200 Behring units of coli antitoxin for each cubic centimeter of the mixture. The eight patients in the group operated on received an infusion of 40 cc. of the antiserum in the peritoneal cavity at the conclusion of the operation. In addition they received daily intramuscular or intravenous injections of 20 cc. of the antiserum for two or three days up to a total dose of from 100 to 120 cc. in the course of four or five days. The six patients not operated on were given daily intramuscular or intravenous injections in the same dosage. The patients were desensitized with normal serum immediately before the administration of the antiserum. No anaphylactic reactions followed. The postoperative course was uneventful. Peritonitis and toxemia were rapidly controlled. The general condition of the patients rapidly improved and progressed to complete recovery in all except two, who had peritonitis with grave toxemia following septic abortion and who had been treated late. For the best results in the prevention of peritonitis, the patient should be given an early direct infusion of 40 cc. of the antiserum while still under the effect of anesthesia, to be followed by further administration. For conservative treatment, the best results are obtained by administering antiserum therapy early in the course of the disease.

Archiv für Ophthalmologie, Berlin

141: 125-338 (Dec. 20) 1939. Partial Index

Pathogenesis of Thrombosis of Vena Centralis Retinae. E. Seidel.—p. 131.
Analysis of Healing Atypical Cataract of Gout. Ostmann.—p. 156.
Comparative Investigations on Behavior of Lens and Cornea Toward Infra-Red Rays. A. Bakker.—p. 180.
Functional Disturbance of Hypophysis of Fracture of Sella Turcica. Marioth.—p. 188.
Retinal Periphlebitis and Tuberculous Etiology. M. Wendling.—p. 198.
*Examination of Hepatic Function in Patients with Glaucoma. H. Schmelzer.—p. 266.
Problem of Strabismus. F. Weckert.—p. 296.
*Value of Chemotherapy in Treatment of Serpiginous Ulcer of Cornea. B. Szinegh.—p. 300.

Hepatic Function in Glaucoma.—Schmelzer has investigated the intermediate metabolism of patients with and without glaucoma. The tests were performed on seventy-eight patients with glaucoma and on seventy controls of the same age. A large majority of patients with glaucoma had a pronounced hypercholesteremia and many gave a positive xanthoproteic reaction. From these observations, impairment of the hepatic function was deduced. Tests of the function in patients with glaucoma demonstrated that, in contradistinction to controls of the same age, an impairment of the hepatic function existed, manifestated by the fact that during tolerance tests with amino acids (aminoacetic acid) the deaminization was retarded. This observation supports the assumption that hepatic disturbances play an important part in glaucoma.

Chemotherapy in Serpiginous Ulcer of Cornea.—Szinegh employed a sulfanilamide preparation chemically identified as 2-sulfanilylaminopyridine in the treatment of serpiginous ulcer of the cornea. One tablet of 0.5 Gm. was given three times daily for five days and, when necessary, the medication was repeated from five to seven days later. In children a smaller dose was given. The chemotherapy was combined with local measures and with injections of foreign proteins. The author gives brief clinical histories of ten patients in whom this treatment was employed. He stresses that, with the administration of sulfanilamide, progression of the corneal ulcer was arrested, a large portion of the cornea remained transparent and a better vision was obtained than in cases treated without sulfanilamide. There were no undesirable secondary effects of the drug.

Archiv f. orthopädische u. Unfall-Chirurgie, Berlin

40: 1-136 (Nov. 24) 1939. Partial Index

Generalized Epiphyseolysis Addescentium and Bilateral Cases of Coxa Vara Adolescentium. W. Müller.—p. 1.
Technic of Bandaging in Traumatic Surgery. P. von Puky.—p. 14.
Treatment of Fractures of Head of Tibia. A. Wuthrich.—p. 71.
Hereditary Aplasia of Interphalangeal Joints and Its Relations to Aplasias of Members. F. Schwarzweller.—p. 84.
*Action of Bone Fracture on Total Organism. T. Kallfelz.—p. 102.
Indefinite Pains in Right Hip, for Years the only Symptom of Spondylitis Lu and Lu. K. Schnaiderth.—p. 114.
Treatment of Vertebral Fracture. J. Lampert.—p. 119.

Action of Bone Fracture on Organism in General.—Kallfelz directs attention to the fact that a bone fracture affects the entire organism and that the healing of a fracture is influenced by existing disease. Bone fracture may be followed by typical signs of shock. The temperature may be increased for several days, probably as the result of the effusion of blood which accompanies the fracture. The effects of a bone fracture on the blood and its elements are manifested by the increase in sedimentation rate, by leukocytosis in the first twenty-four hours, by a fall in the erythrocytes and by alterations in the cholesterol, chloride, calcium and sugar contents of the blood. Bone fracture influences the sodium chloride, nitrogen, urea, proteins and substances giving a xanthoproteic reaction. The influence on the glands of internal secretion, particularly the thyroid, the parathyroids and the hypophysis was noted by several observers. Circulatory disturbances induced by bone fractures manifest themselves as hypostatic pneumonia, edema, thrombosis or embolism. The occurrence of fat embolism is dependent not only on the quantity of fat but on its state of emulsion as well. Urinary calculi may form after vertebral fractures.

Beiträge zur Klinik der Tuberkulose, Berlin

94: 99-182 (Dec. 18) 1939

Technic and Results in Extrapleural Pneumolysis. W. Curschmann.—p. 99.
*Contralateral Effect of Artificial Pneumothorax. H. Hofmann.—p. 121.
Tuberculosis and Pregnancy. H. Hangleiter.—p. 145.
Osteitis Tuberculosa Multiplex Cystoides: Case. M. S. Erk and K. S. Saracoglu.—p. 173.
Tuberculosis and Patient's Emotional Life. A. Wiesinger.—p. 179.

Contralateral Effect of Artificial Pneumothorax.—Hofmann studied the reaction of artificial pneumothorax on the opposite lung in 100 cases. Twenty cases with a unilateral infection progressed favorably and were dismissed from consideration. In the remaining eighty cases more or less limited recent infiltrations were found in the opposite lung before artificial pneumothorax was induced. In sixty-eight (85 per cent) of these, pulmonary lesions were either inactive or regressing and the sputum was bacilli free at the end of one year, with the exception of four. The other twelve cases (15 per cent) disclosed extension of the existing foci in the opposite lung during unilateral artificial pneumothorax. Six patients died and six recovered after prompt recourse to bilateral artificial pneumothorax continued for two years. The author attributes three of the deaths to pubertal implications (ages between 10

and 17), two to mismanagement and one to the patient's rejection of proposed collapse surgery. Since new foci were never observed to arise in the opposite lung in well managed artificial pneumothorax, he believes that this procedure protects the other lung from infection. No permanent activation need be feared in cases of demonstrable calcification. Since exacerbations may ensue after institution or before termination of this procedure, careful roentgenologic supervision is required at all times. Exacerbations in the opposite lung after termination of artificial pneumothorax are similar to original infections both in their nature and in their modifiability. The author believes that bilateral artificial pneumothorax is indicated only if degenerative processes are observed in both lungs. Collapse surgery is not indicated as the initial method of choice.

Klinische Wochenschrift, Berlin

18: 1589-1612 (Dec. 23) 1939. Partial Index

Connective Tissue Space and Its Relations to Parenchymal Cell. D. Reller.—p. 1592.
Enrichment of Diet with Vegetable Protein. F. Lommel.—p. 1596.
Counting of Retecytes (So-Called Reticulocytes). G. Sack.—p. 1598.
Investigations on Pancreatic Ferments of Fifty Policlinical Patients with Epigastric Symptoms. L. Ehrhardt.—p. 1600.
Mandelic Acid and Infection of Urinary Passages with Colon Bacilli. H. Gross and G. Hennig.—p. 1603.
Device for Irrigation of Rectoscope. S. Kuthan.—p. 1603.
*Transfusion of Plasma-Free Erythrocytes. H. Beumer and K. Schwartzer.—p. 1604.

Transfusion of Plasma-Free Erythrocytes.—Beumer and Schwartzer tried the transfusion of erythrocytic pulp that was practically free from plasma. Animal experiments revealed that erythrocytes obtained from blood after centrifugation and withdrawal of the plasma can be injected intravenously without eliciting disturbances. The erythrocyte count of rabbits increased from six million to twelve million when two or three injections of erythrocytes were made within two days. Next the authors employed the method in a moribund nursling with atresia of the bile duct and in two children with severe postleukemic anemia. These children were injected with 120 cc. of erythrocytes from 250 cc. of whole blood. The procedure was used with good success in a nursling with goat's milk anemia. The authors observed that the injection of erythrocytes was tolerated better than the injection of twice the amount of whole blood. They emphasize that before the erythrocyte pulp is introduced it must be filtered through a thin layer of muslin in order to remove the platelets and leukocytes that adhere to it. The remaining plasma was used for other purposes.

Zeitschrift für Krebsforschung, Berlin

49: 443-656 (Dec. 20) 1940. Partial Index

Influence of Climate on Growth of Spontaneous Malignant Tumors of Mice and Inoculation Tumors of Rats. G. Banzer.—p. 443.
Innervation of Carcinoma. A. Abrahám.—p. 470.
Cellular Storage of Cancerogenic Hydrocarbons. A. Graffi.—p. 477.
Incidence of Cancer and Necropsy Statistics. W. Fischer.—p. 494.
Experimental Production of Tumors in Salivary Glands. E. Benoche and J. Schröder.—p. 505.
*Some Chemotherapeutic Compounds Effective in Inoculation Tumors. C. Dittmar.—p. 515.
Carcinosis of Pulmonary Lymph Nodes in Multiple Cancer Embolism of Small Branches of Pulmonary Artery. M. Schrigle.—p. 573.
Carcinogenic Benzpyrine Obtained from Tobacco Tar. A. H. Roffo.—p. 588.

Chemotherapeutic Compounds in Inoculation Tumors.—Dittmar discusses compounds capable of exerting a chemotherapeutic action on inoculation carcinoma. Bromoacetic acid and iodoacetic acid and their derivatives greatly inhibit the tumor glycolysis and exert a slight influence on the growth of tumors; on account of their great toxicity, however, they are of no therapeutic value. The slightly toxic halodicarboxylic acids, bromosuccinic acid and bromomalonic acid, are suited for therapeutic purposes. The author assumes that they are decomposed in the organism into monocarboxylic acid and exert their action as such. Chemotherapeutic action is exerted also by some compounds of chaulmoogra, especially by chaulmoogrylzephirol. Colchicine likewise inhibits tumor growth but is extremely toxic. Less toxic derivatives such as colchiceine and oxycolchicine are ineffective. Garlic oil contains a volatile substance which injures tumor cells and bacteria. The author believes that this substance is probably diallylsulfide. The effective group of this compound is the allyl group, for diethylsulfide is without influence on the growth of tumors. Bactericidal compounds, such as the p, p-diamidodiphenylsulfoxide, inhibit tumor growth. Heptylaldehyde liquefies spontaneous tumors (mammary carcinomas) in mice probably as the result of capillary damage caused by the substance. The growth of inoculation tumors is likewise inhibited by heptylaldehyde and by the unsaturated aldehyde citral, which is even more effective.

Ugeskrift for Læger, Copenhagen

102: 115-144 (Feb. 1) 1940

*Case of Chronic Hemolytic Anemia with Nocturnal Paroxysmal Hemoglobinuria. P. Arndal.—p. 115.
*Attempt at Treatment of Eunuchoidism with Gonadotropic Hormone and Testis Hormone. E. Roelsen.—p. 123.
Case of Diaphragmatic Hernia (Hiatus Hernia) Treated with Transthoracal Operation. A. Sennels.—p. 128.
Control Fluids for Protein Determination by Glass Bead Method. J. Bing.—p. 130.

Hemolytic Anemia with Nocturnal Paroxysmal Hemoglobinuria.—Arndal states that essential hemoglobinuria can be classified in four main groups, one of which is atypical paroxysmal hemoglobinuria. He tabulates the thirty-three cases published in the literature and adds a personal case. The disorder most often occurs in the third or fourth decade of life and affects men and women equally. The onset is insidious or with slight pain in the abdomen, epigastrium or lumbar region together with occasional fever and chills. Jaundice is frequently the first symptom, but hemoglobinuria may be present from the beginning. The liver and spleen are enlarged. The general condition is not greatly disturbed, although an anemia of about 50 per cent develops. The hemoglobin percentage is ordinarily from 25 to 50 with an index of about 1. The red blood corpuscles vary from 900,000 to 3 or 4 million. There is generally a moderate leukopenia. A slight lymphocytosis may be found. The bleeding time, coagulation time and osmotic resistance are normal. A plasma color count from 15 to 20 is usual. In almost all cases the red blood picture shows a slight anisocytosis and poikilocytosis. There is a constant reticulocytosis of from 10 to 15 per cent. Periodically the urine is almost black, contains oxyhemoglobin and has no red blood corpuscles but gives a positive albumin reaction. Considerable urobilin appears in the portions of the urine without hemoglobin. The disorder is not curable. It is believed to be fatal in the course of some years. In Rosenthal's case the duration was thirty-three years. Death is usually due to venous thrombosis. Microscopically the pathanatomic examination reveals the spleen pulp deficient in cells but without pathologic changes. In the liver, necroses appear around venae centrales. Hemosiderosis in the renal cortex is typical and always localized in tubuli contorti and Henle's loop. Parenchymatous degeneration is seen in the kidneys. The bone marrow is usually hyperplastic. The etiology and pathogenesis are not clear. Authors apparently agree that treatment other than quiet and rest in bed during exacerbation, together with iron and liver in treatment of the anemia, should not be instituted. Arndal suggests the possibility that oscillations of the carbon dioxide tension in the blood may account for the nocturnal appearance of the hemoglobinuria.

Eunuchoidism Treated with Gonadotropic and Testis Hormones.—Roelsen describes a eunuchoid, aged 25, with marked genital hypoplasia corresponding to the development in a child of 5, lack of secondary sex characteristics and greatly retarded closure of the epiphysis. After treatment with large doses of gonadotropic substance for about a year and a half puberty occurred, and subsequent treatment with large doses of testis hormone (900 mg. of testosterone, mainly as testosterone acetate) for about three months resulted in increased growth of the prostate and marked stimulation of the secondary sex characteristics. The author found the testosterone preparations equally effective whether applied as an inunctum or injected. He says that treatment with testosterone is a substitution therapy, its effect rapidly subsiding on discontinuation. In his opinion the prognosis is doubtful. To establish an approximately normal sexual life, substitution therapy with androgenic substances seems the only course.

THE STUDENT SECTION

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Devoted to the Educational Interests and Welfare of Medical Students, Interns and Residents in Hospitals

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The Training of the Intern

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NEW YORK

The education of interns and residents is a major responsibility of the modern hospital. The true objective is the preparation of young physicians for their future work as independent practitioners. The Morrisania Hospital has taken an active part in the training of interns and residents, and its work has been original in many respects. The main purpose of the program for interns is proper training, education and supervision. The suggestions presented at this time will lend themselves for adaptation in any hospital that has an adequate supply of clinical material.

In dealing with problems of hospital administration, the administrator sometimes overlooks the problem of the new intern, who has difficulty adjusting himself to a new environment, a new hospital and a new routine. In many hospitals the intern has to grope his way through the institution before he becomes acquainted with its various divisions, its personnel and its functions, and many of them do not get in touch with some departments during their entire stay in the hospital. It is therefore important that interns before commencing their internship be given a personal interview by the superintendent and his assistants, at which time a discussion and clarification should be made of the rules and regulations of the hospital, outline of routine duties, care of the patient, treatment of the patient's family, and attitude toward the nursing staff, the attending staff and other members of the hospital personnel.

INTRODUCING THE NEW INTERNS

Through the cooperation of the administrative, nursing, social service and dietary divisions it was possible to formulate a program which is given to the members of the intern group on five consecutive days prior to the commencement of their internship. The program consists of seven lectures and demonstrations. The superintendent discusses the following subjects with the new interns: (1) rules and regulations of the hospital; (2) hospital records, with emphasis on the importance of proper history taking, a complete physical examination, daily progress notes, the proper signing out of patients, the confidential nature of all information learned about a patient, and the completeness of records; (3) nomenclature of diseases; (4) the necessity of morning and evening rounds; (5) local laws pertaining to contagious diseases; (6) medical examiner's cases; (7) the importance of postmortem examinations; (8) the question of gratuities and other ethical problems, and (9) courtesy.

The new interns are greeted by the president of the medical board of the hospital, who introduces them to each board member and points out his exact position on the board. The deputy medical superintendent outlines the two year service, which consists of a medical and a surgical appointment. Both appointments include medicine, surgery, obstetrics, pediatrics, eye, ear, nose and throat work, the outpatient department and ambulance and emergency room service. The medical forms are demonstrated to them. These are births, death and stillbirth certificates, autopsy consents, food passes, admission forms, sheets for history, physical examination, condition, treatment, progress notes and other material. The hospital manual is presented. This is a compilation of about 130 mimeographed pages and may be referred to as the hospital Bible, as it covers everything. The intern is also given to understand that he may consult with the administration at any time on any problem he desires. He is advised of the formal monthly meeting between the intern staff and the medical superintendent, which is held for the purpose of talking over problems.

The superintendent of nurses greets the new interns with a discussion on nursing problems. The nursing service is always anxious to assist the intern and the patient in solving their prob-

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lems. Nursing of good quality consists of care of the patient with the cooperation of the nurse, the physician and the family.

The interns are taken on an orientation tour of the hospital so that they may become acquainted with its various divisions and with

The superintendent and deputy medical superintendent explain the rules of the hospital and the rotating schedule, respectively.

their functions in relation to the hospital and themselves. This includes the nonclinical service departments as well: kitchens, laundry, power house, stores, information desk, switchboard, compensation office, investigation division and property clerk.

The chief dietitian discusses dietetics in health and disease. Whenever possible a patient should be put on the general diet lists. Special diets must be justifiable on the grounds of clinical observations and laboratory data. It is always desirable to include the diagnosis when ordering a special diet. The dietary department answers questions gladly and welcomes consultations with the intern on special cases at any time.

The social service department tries at all times to cooperate with the medical staff whenever possible. The following cases are a few of the types referred to social service: orphans, foundlings, deserted babies or mothers; unmarried mothers; homeless, destitute or tuberculous patients; patients requiring convalescent care; patients whose relatives must be located; patients requiring clothing on discharge; children requiring a boarding home; mothers who cannot give proper care to their children, and patients who require special follow-up work.

MEDICAL EXAMINATION OF THE INTERNS

Two days before the beginning of their internship the new members of the house staff are given a complete physical examination, including x-ray study of the chest, a complete blood count, urinalysis and other laboratory procedures. Complete records are kept. The examination is repeated annually. Morrisania Hospital now has one of the best intern health programs in New York. This is personally carried out by the various specialists in the field of medicine attached to the hospital staff. On the day after the physical examination the interns are assigned to their rooms and services and are given their uniforms, so that on the day of their appointment they are ready to begin work in their respective wards.

DEMONSTRATION OF COMMON MEDICAL PROCEDURES

Training in the operating room technic includes learning to scrub for operation and becoming familiar with the instrument tray. The preparations consist of cleansing the hands, change of uniform, the approach to the operative field, changing gloves during the operation and changing position during the operation. The interns are also taught the rules of the operating room, the rules governing spectators in the operating room, the care of instruments and the arrangement of the suture tray.

The operation of the blood bank is explained, including suggested methods for obtaining blood. The collection and distribution of blood, directions for taking blood and directions for administering blood are given.

The infusion technic is demonstrated, together with the procedure for cutting down on the vein.

An abdominal tap, a chest tap and a spinal tap are performed, with emphasis on the indications and the necessary articles required.

The operation of the oxygen tent is demonstrated and its use and hazards are explained. Interns are familiarized with the use, the operation and the function of the respirator. They are acquainted with the Wangensteen duodenal drainage tube and the Winkelstein drip, a form

Instructions in hospital records and nomenclature.

of treatment of peptic ulcer in which a continuous feeding of milk and cream is given to the patient; with this procedure a stomach tube is passed and the flow of milk is regulated.

MANAGEMENT OF EMERGENCIES

The intern is instructed in all the known emergencies which he may meet in homes or on the street. He is told to be courteous, cool, calm

and collected at all times and, no matter what the disaster may be, to observe carefully all alcoholic patients, compound fractures, penetrating wounds and surgical abdominal involvement. He is taught the importance of consents for operations on minors, signed and witnessed

Nursing procedures are demonstrated.

releases, complete records, speed in responding to calls, and the reporting of contagious diseases to the board of health.

An emergency tracheotomy is demonstrated in the morgue, the operator pointing out the indications and the instruments used. The intern is impressed with the significance of certain rules: to do it early, never to use general anesthesia on a dyspneic patient, not to give morphine, and to observe the importance of after-care.

The resident in traumatic surgery demonstrates the first aid treatment of fractures, which is most important for the patient who has to be transported from the scene of the accident to the hospital. This illustrates the part played in the education of the intern staff by the resident. The admitting doctor acquaints the new intern with the contents of the ambulance bag and emergency medications. The three months of ambulance service includes an active participation in the treatment of emergency patients, who may either walk in or be transported to the emergency room.

In the laboratory the intern should not be regarded as an employee and be burdened with time-consuming repetitions—work better done by paid technicians. Rather he should be expected to follow up the blood and urine tests and the pathologic specimens of the cases to which he is assigned.

NURSING PROCEDURES

The intern is taught ordinary nursing and medical procedures such as giving various kinds of enemas, administration of hot and cold packs, hypodermoclysis, preparation and application of a mustard plaster, methods of restraining disturbed patients, management of the croup tent, application of turpentine stupes, irrigations, and the care and prevention of bed sores. The demonstration of a mustard paste or an ear irrigation to the interns has led to many instructive inquiries. The purpose of this type of training is to familiarize the new interns with the essentials of common procedures, too frequently overlooked or entirely forgotten. They are the procedures which a doctor in practice may be called on to do or direct. The prevention and treatment of bed sores are shown with explanations of nursing measures and mechanical devices. The interns are taught the technic of absolute cleanliness, massage with a rotary motion, alcohol rubs, frequent change of the patient's position, keeping the foundation sheets tight, keeping the bed free from crumbs, and using pads to keep the skin surfaces apart. They are shown the use of air rings, cotton rings, air mattresses, padding for bony prominences and pillows. Pressure sores must always be reported to the head nurse. The treatment given must be approved by the doctor.

OTHER FEATURES OF TRAINING

The record committee chairman of the medical board, with the assistance of the record librarian, instructs the newly arrived interns in the use of the standard nomenclature. He explains what constitutes a proper history, physical examination, summary, progress notes and discharge notes. It is impressed on the intern that defective charts will be called to his attention by the record librarian.

The recreational side of the intern's life is frequently overlooked, yet in view of the exact-

Training in reading of electrocardiographic tracings.

ing demands made on him this should be considered essential. The living quarters should be sufficiently isolated that the interns may feel free to relax. A quiet corridor and individual rooms, affording privacy, are factors to be considered. A radio, a card table, a piano and, if space permits, a billiard table should be provided. For outdoor recreation a tennis court or handball court (or both) is beneficial.

The intern is encouraged to think for himself. He records the history, the physical examination and his own diagnosis, which are checked by the resident or the senior house officer. The visiting physician in each instance then checks

Instruction in interpretation of x-ray films.

the house staff's work, calls attention to errors and supplements the clinical work with any additional observations, which he signs. The intern follows the progress of the patient from time to time as indicated, enters progress notes on the chart and records the patient's condition on discharge. Discussion of the condition of a patient with the closest relative or the next of kin is an important function of any hospital. The hour of 11 a. m. is set aside for this purpose at our institution. This pleasant relationship leads to a more friendly community and to greater facility in obtaining consent for autopsy.

Education is maintained by practical lectures, which are given on forty Wednesday afternoons during the year on the common necessary things that a doctor should know. These are given by members of the attending staff and prominent men in medicine in New York and other cities. Topics are chosen by the interns.

The intern is assigned to the outpatient clinic for six weeks as part of his regular rotating service at the beginning of his second year of internship. A systematic program of instruction in the form of postgraduate training is conducted by the senior members of the visiting staff, including venereal disease, office gynecology, urologic diagnosis, dermatology, allergy, proctology, physical therapy, electrocardiography and injection of varicose veins. The greater number of these are not encountered in a general internship in the inpatient department, but they will be encountered later, in office practice.

Bedside work and routine ward rounds with his chief and associates should be the high lights in the day's work of the intern. Here the chief concern should be differential diagnosis and treatment, and the intern should be made to familiarize himself with the ophthalmoscope, auroscope and the other diagnostic apparatus and measures which are ordinarily used by the general practitioner. At this time the chief of service should review the record and make such comments or corrections on the charts as are necessary.

The departments of pediatrics, obstetrics and gynecology, medicine, surgery, pathology and roentgenology have their weekly conferences and rounds, at which time attempts are made to teach the intern. Interns and residents present reviews of histories, diagnoses and treatment, which are further discussed by the attending staff. Every casualty is minutely studied for detection of errors either in judgment or in procedure.

In addition, the interns hold their own conferences. The educational committee of the house staff arranges weekly conferences consisting of the presentation of interesting cases throughout the institution. An attempt is made to correlate the clinical, roentgenologic and pathologic data. The presentations afford a kind of forum for our young and ambitious interns in preparation for future academic endeavor. Interns and residents meet every Wednesday afternoon in the hospital library and review the current medical literature. They also participate in

The interns frequent the medical library. The taller of the two gentlemen standing is Dr. Nathan B. Van Etten, President-Elect of the American Medical Association.

follow-up clinics, an extremely important factor in the teaching of interns and residents.

Finally, I wish to state that the quality of medical service and intern teaching entails dual responsibility: it depends on interest shown both by the administration and by the medical staff.

The Medical Student Before and After Graduation

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I am speaking here as one of you and as one whose medical wanderings and experiences are, fortunately, as yet not far removed from yours. I shall try to describe to you some experiences which have proved constructive, as well as some which have been nonproductive or even harmful. I shall mention some ideals, many of which, though far from being attained, have served as beacons in guiding me amidst difficulties. For, as an able Boston surgeon, Dr. John Homans, has said: "No one ever practices quite what he preaches. If he did, he would be too unspeakably virtuous."

It has often been maintained that one learns only through trial and error. There is the skeptic, who claims that teaching exerts little influence and that instruction is not likely to sink very deeply into the minds of students. And yet a teacher may hope that even the student who is wisely skeptical and, on the surface, blasé will tuck certain instructions away in his subconscious mind, just to recall them for test years later when he faces a similar problem alone. If experience has proved that the instructor of his school days is correct, the heretofore "clever" but "suspected" instructor becomes a trusted and beloved teacher and colleague. Thus the results of the best teaching become increasingly effective as the student's experience grows with advancing years. Even if what is taught proves eventually to be untenable the effort is not wasted, for the believer uses such knowledge as a guiding theory during the initial stage of his medical voyage. Like other theories, this too is subsequently discarded, when the student has gained self assurance as a result of accumulated experience. Hence the best way to learn is to be open minded and yet skeptical, to believe and to disbelieve at the same time. I beg of you to adopt this attitude toward what I have to say.

DISILLUSION

The first years in medical school, struggling with anatomy, biochemistry, physiology and pharmacology, often bring hardships and one wonders what all this has to do with bedside medicine. Then come the clinical years with new stimulus and with human contact as symbolized by the use of the stethoscope. But soon a new disillusion is experienced. The student discovers that the knowledge and power of the once admired clinical teacher are limited and that medicine can cure but few diseases. He asks himself "Is this, then, the field I dreamed of? Shall I take up surgery, in which field, at least, I can use a knife?" And later in the hospital he wonders "How and where can I start to practice? Shall I be able to compete with others and can I ever make a living? Will it be possible to keep up with medical progress if I settle down in a small community? Am I wise even to contemplate practicing when it looks as if medicine is becoming 'completely socialized'?" And so some day after graduation, when a little tired and depressed, you will discover that "graduation," once the "great goal," was but a formality; that you were a student before it and that you remain one after; that your problems are increasing and not decreasing, and that, after the sheltered and artificial atmosphere of the school, you are now sailing on an ocean of limitless horizon.

Magendie said "Medicine is science in the making." Well, a century later it is still in the making. Medicine actually, however, represents a field with ill defined borders in which science, human relations and empiricism mingle. Each of us knows but a limited portion of this field and each of us practices medicine somewhat differently. Knowledge of detail is essential but it is inadequate. What we need is crystallization of principles which will unlock the mysteries of many problems and will relieve the mind crowded with unrelated facts.

STARTING YOUR CAREER

With your entrance into medical school your medical career starts. It is a full time life career. You cannot afford to neglect any part of this training. A medical school training of four years, on the other hand, cannot make a physician. The primary function of the medical school is to give training in intelligent and keen observation, in critical analysis and in the right approach. As a result of demonstration of the broad principles of the biologic sciences and their applications to clinical medicine you will become convinced that the two are closely linked. At the same time the significance of clinical medicine as an independent discipline, built on classic tradition and on the empiric practices of the ages, will be demonstrated to you.

Gradually, as you progress in medical school, the patient becomes the center of interest and activity. As Lord Horder advises: "Whatever may be the special branch of medicine that attracts us, it is commonly accepted that it is at

From the Medical Clinic of the Peter Bent Brigham Hospital and the Department of Medicine, Harvard Medical School.
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the bedside where, on the one hand, the vital expressions of disease are manifested and where, on the other hand, the contributions made by laboratory, both to diagnosis and to therapy, must eventually be tested . . . 'Les malades, toujours les malades.'" Ryle describes as the aims of clinical science "to increase and perfect our knowledge (with a view to its control) of disease in man, and equally our knowledge of man in disease, by every legitimate means of science and art at our disposal. In furtherance of this aim the study of healthy structure and function plays a leading part."

Obviously in the course of your undergraduate training you not only should expand your knowledge but also from time to time should bring the acquired information into new perspective. In the first stage of medical teaching, simplification and segregation are inevitable. Subsequent experience forces modification and change of emphasis. During the first and second years, for example, edema means but a physiochemical disturbance in which changes in the osmotic pressure of the blood, capillary pressure and permeability play a role. By the fourth year, however, edema represents a symptom or a sign occurring in a number of diseases. The underlying mechanism of various types of edema in patients varies. Hence the proper recognition and interpretation of edema become an important aid in diagnosis and treatment. In the clinical analysis and treatment of edema your combined knowledge of physiology, chemistry, pathology, pharmacology and clinical medicine will come into play. If you carefully analyze the edema presented by the patients, you will also discover that the information gained in physiology and biochemistry is not adequate to explain all edemas observed at the bedside. You will begin to suspect that chronically deranged intercellular spaces must also play a part in certain types of edema. Thus clinical medicine frequently suggests investigative problems in physiology and biochemistry. Even if you are not an investigator, you should cultivate the spirit of search in the study of the patients. This spirit eliminates the drudgery of daily routine and is the best stimulus to good practice.

It is essential that, as you advance in a field, your vision and aim should progress also. Otherwise you may repeat the same activity year after year. Let us take the study of internal medicine as an example. This course is usually given during three years, but in each year the aim is different.

In the second year course in medicine one learns physical diagnosis. Technic of eliciting signs is acquired, and this work offers good opportunity for the development of the power of observation. In order to take diagnostic advantage of physical signs, however, recognition of a sign is not sufficient, for the same physical sign under different conditions may have different significance. Thus a systolic murmur over the base of the heart may originate from syphilitic aneurysm, from atherosclerosis of the aorta or from aortic stenosis. Furthermore, it is essential to appreciate the limitations of physical observations as well as the factors which interfere with the elicitation of physical signs. In the presence of emphysema, for example, estimation of the size of the heart by percussion is not feasible. Similarly in pneumonia in the presence of emphysema bronchial breathing is often absent. In order to recognize significant quantitative deviation from normal signs, extensive experience with the examination of normal persons is essential. To realize the significance of the absence of abnormal physical signs in ruling out the presence of certain diseases, one needs broad clinical knowledge. Thus, advanced knowledge of physical diagnosis can be acquired only after years of training and then only if the path of such development has been pointed out to the student.

THE THIRD YEAR

In third year medicine, instruction is given in the technic and interpretation of history taking and in clinical laboratory methods. After this the student makes the first attempt to diagnose disease. He must learn to differentiate between an established diagnosis and diagnostic probabilities. But capacity to label disease correctly is not equivalent to ability to understand the patient. The latter experience is left to the fourth year. By this time the student is able to diagnose disease and is now ready to undertake the analysis and treatment of the patient as a psychophysical unit, on the one hand, and to study the natural history of disease, on the other hand. In this final task the student uses all the tools acquired in his earlier school years. One of the most difficult educational tasks is to convince students of the fundamental importance of a careful follow-up study of the patient. Diseases do not fall into categories as indicated by textbooks. Each disease is characterized by numerous variations in its course and complications. Unless the student appreciates this fact and learns the course of disease, his undergraduate experience will remain incomplete. The time allotted for the study of clinical medicine is inadequate even if the student does his best. As in investigation, so in the acquisition of an education, useless repetition is frequently mistaken for thoroughness, whereas usually it is but the result of too great inertia to advance on the part of the teacher or the student.

Diseases as observed in a university clinic do not represent a true sample of their natural occurrence. Training in an outpatient depart-

ment is the closest approximation to the true situation. Here the student has an opportunity to study the incipient stages of "organic" disease as well as of disorders characterized mainly by functional and reversible changes. But again this training, to be effective, must be undertaken with zeal and vision. The undergraduate is usually fascinated by the problems of mitral stenosis, pneumonia, dissecting aneurysm, perforated ulcer, gallstones and cancer. He has an instinctive aversion toward the understanding of headaches, colitis, neurosis, skin lesions, arteriosclerosis, varicose veins, boils and other so-called minor maladies. Patients suffering from such ailments are "uninteresting." Such an attitude on the part of the student is to a large extent a reflection of the attitude of his teachers. Visiting physicians often spend hours at the bedside of a patient suffering from thrombosis of the inferior vena cava or from some other rare syndrome, while they frequently pass by the patient suffering "only" from arteriosclerosis, incipient tuberculosis, migraine, common cold or disturbance of the emotions and intellect. As a matter of fact, a study of the incipient stages of diseases and of the disorders of ambulatory patients represents the greatest challenge to an able physician and teacher.

THE PATIENT'S PERSONALITY

It is a serious shortcoming of institutional teaching of clinical medicine that the patient is apt to be stripped of his personality in the hospital. Unless the student makes a special effort, he may fail to appreciate the significance of the emotional and environmental components in disease. Social and psychic factors play a role in every disease, but in many conditions they represent dominant influences. It is essential to evaluate in each patient the quantitative role of these factors. It is a common experience to find that the mystery of complaints fades as soon as a good history of the patient's personality and social status is elicited. In private practice some of these difficulties solve themselves because it is inevitable to observe the multiple environmental influences on the patient when he is visited in his home. Indeed, the old fashioned practitioner has at times been too much influenced by these aspects, often at the expense of other active forces. If the student assumes a humane and sympathetic interest in the patient and if he is taught to analyze and study these aspects of disease rationally, he will not overemphasize the importance of the materialistic part of medicine as compared with the human side. Routine analysis of personality and social factors also offers excellent training in tact and patience. As a result the student will soon find that mental factors represent as active a force in the treatment of patients as chemical and physical agents. This general problem is important and, at present, somewhat neglected.

The student should acquire early a taste for a critical reading of medical literature by taking active part in journal clubs and by frequently visiting libraries. As a result he will learn to discriminate between good and bad suggestions and will be able to continue to acquire sound medical knowledge after graduation. He should not specialize too early in the medical school unless he is sure of his taste. He should not let the spell of great leaders completely hypnotize him. As Peter Latham said long ago "But beware of great authorities. They have a tyrannous way with them."

If a field seems difficult or if you have neglected it, it is never too late to make a new effort to acquire such knowledge. Often, with new interests and mature experience, dull and obscure problems become interesting and clear. Our tastes and interests change continuously.

The student must make a constant effort to broaden himself. It is essential to understand human emotions, desires, frustrations and fears. We can apply to medical students and physicians T. S. Eliot's belief that ". . . what one must be judged by, scholar or no, is not particularized knowledge but one's total harvest, of thinking, feeling, living and observing human beings." Osler, in a farewell address to American and Canadian medical students, gave the following advice: "The strength of a student of men is to travel, to study men, their habits, character, mode of life, their behavior under varied conditions, their vices, virtues and peculiarities. Begin with a careful observation of your fellow students and of your teachers; then every patient you see is a lesson in much more than the malady from which he suffers. Mix as much as you possibly can with the outside world and learn its ways."

IN TOUCH WITH LAYMEN

It is often sadly recalled that physicians trained in the humanities were a fine type and that they were particularly well qualified to keep the medical profession in intimate touch with the world of laymen. This kind of medical education, it is claimed, is gone for good. I do not agree with this. The early development of the ethical and esthetic sense is fundamental in the development of physicians of the future. This sense can be cultivated through the study of religion, the humanities and the arts. The more we train our senses in these fields the deeper our sympathies become, the less prejudiced our mind and the better our judgment. Dr. Hans Zinsser, in writing of the late Francis W. Peabody, remarked "it is a rare blending of

learning and humanity, incisiveness of intellect and sensitiveness of the spirit, which occasionally come together in an individual who chooses the calling of medicine, and then we have the great physician." Osler said "The Lathams, the Watsons, the Pagets, the Jenners and the Gardiners have influenced the profession less by their special work than by exemplifying those graces of life and refinements of heart which make up a character."

IN THE HOSPITAL

A hospital internship is an essential bridge between the medical school and practice. The graduate should consider the hospital as a college. From the outset he must carry the conviction that the study and care of the patient are a challenge to the highest type of intellectual functions. In the hospital he must remain in constant contact with patients, and the work in the ward must always remain the backbone of activity.

The training acquired in medical school will find full application in the hospital, and, in addition, some new qualities of the young physician will come into play. Of these, judgment and responsibility are the most important. If the intern undertakes his hospital work with zeal, his development will progress at a remarkable pace month after month. This sensation of growth and the acquisition of new vistas are the greatest compensation for hard work. The heavy responsibilities placed on the shoulders of an intern will sharpen his powers of observation, improve his medical knowledge and ripen his judgment. Work of varying intensity will make him flexible and will train his sense of proportion. As Peabody observed, "The difficulty is that in the hospital one gets into the habit of using the oil immersion instead of the low power, and focuses too intently on the center of the field." Often the intern will be required to act promptly and independently and yet he will have to maintain perfect team work. The effectiveness of a house staff depends as much on the *esprit de corps* as on the ability of the individual members. I have seen the efficiency of the house staff wrecked by the uncooperative attitude of a brilliant egocentric intern. The right sort of house officer is always willing to lend a helpful hand to his comrade. The attitude of the intern of advanced standing is particularly important because he is the tutor of his junior. As you advance as a house officer do not forget the way you felt your first month in the hospital, when responsibilities loomed insurmountable. Be sympathetic and reassuring toward the junior, whose nervous system is strained by the unaccustomed heavy responsibilities. If you were abused as a junior, do not take compensation in similar practices. An internship is one of the greatest trainings in the building of medical character.

The value of a house officership is proportional to the intelligent thought and work put into it. A good intern must be a good teacher as well as a good student. Members of the visiting staff often expect to learn as much from the intern as the intern can learn from them. In many hospitals the house officer is left to his own initiative to a large extent. His development is therefore mainly self education based on knowledge and experience acquired in the medical school. But organized journal clubs, joint demonstration of cases, discussions and clinicopathologic conferences will solve the problem of his education. If the young intern becomes disillusioned with medicine because of its present limitation, he should take refuge in recent discoveries and he should resolve to take an active part in medicine of the future.

THE INTERPRETATION OF SYMPTOMS

The house staff should take full advantage of the opportunities for taking good histories, for making thorough physical examinations and for developing the art of medical logic in drawing conclusions. Cultivation of the art of concise and lucid description of the patient is essential. Notwithstanding the remarkable development of technical devices in recent years, the importance of the interpretation of symptoms remains as great as ever before. As a result of the better understanding of the mechanism of such symptoms as pain, dyspnea, orthopnea, vomiting, cyanosis, fever, chills and headache, today we are able to use these symptoms as tools in probing into the depths of the body. Intelligent interpretation of symptoms will often dispense with laborious, expensive and painful laboratory tests. Progress notes should give detailed and clear statements of the changes taking place. It is advisable to acquire the habit of listening with an open mind to the patient and to persons around him. Their diagnostic or therapeutic suggestions are often helpful. I never hesitate to ask the patient what he thinks is wrong with him. His answer often reveals his attitude toward his disease. Follow-up of patients is essential in medical training. The intern should find time to attend necropsies. I believe in keeping a record of one's mistakes with an explanation of the reasons for them. Periodic examination of such records reveals illuminating facts on one's shortcomings.

The use of the laboratory requires special consideration. The important function of laboratory procedures in the study and the care of the patient is an established fact. Their relative role, however, is still a subject of controversy. There are those elders who bemoan the abuse of the laboratory. This they hold responsible for

the rapid decline of the "art" of medicine. Some of them claim that laboratory tests are but crude substitutes for the more sensitive human senses. And there are, on the other side, the younger and inexperienced ones who expect the instruments in the laboratory to give them the diagnosis.

Now what is the true situation? The use of laboratory methods must be rational. The laboratory should answer specific questions which arise in the clinical study of the patient. They should be used as an objective check on the history and the physical observations. If properly used, laboratory observations are enlightening and they develop rather than hinder clinical acumen. Laboratory procedures have eradicated the clinician who could tell from feeling the pulse whether the patient had received digitalis, who could diagnose typhoid from the odor of the patient or carcinoma of the stomach from feeling a Virchow node. Some "clinicians" rightly point out with pride that clinical signs may precede structural changes. In fairness, however, it must be acknowledged that the opposite situation is frequent. The x-rays, electrocardiograms, the numerous chemical tests have made correct diagnosis possible with a frequency heretofore undreamed of. Laboratory methods made it possible to correlate clinical manifestations of disease with underlying physiologic processes, and this correlation in turn has made it possible, subsequently, to understand and interpret symptoms and signs without recourse to laboratory methods. Recent developments in chemotherapy in infections demonstrate the mutual importance of close correlation of laboratory data with the clinical state of the patient.

LABORATORY TESTS

The upshot of this problem then is that it is a mistake of equal magnitude to neglect indicated laboratory tests or, contrariwise, to use laboratory tests indiscriminately. In the best hospitals this situation is being recognized. Just because a test appears to be objective and because the results are expressed in curves or in figures, one must not take them too seriously. A poorly performed or an unreliable method is more misleading than no laboratory work. In recent years the abuse of laboratory methods has been the greatest in hospitals in the smaller communities. Curiously enough, practitioners of outlying communities have more respect for laboratory methods than the clinicians of university centers trained in these methods.

The indiscriminate use of laboratory methods is harmful to the prestige of the medical profession. It places unnecessary financial and emotional burden on the patient. Perhaps there is more than just a whimsical touch in the poem recently written by Secretary of the Navy Charles Edison while he was an inmate of a hospital in Washington:

> They hitch up wires to your leg,
> On arm and back and chest
> To see how goes the pump today
> And if you need a rest.
>
> They do a lot of other things
> Indelicate to tell,
> 'Til you begin to speculate
> "God, was I ever well."

The same sentiment was expressed by a patient who several weeks after returning home sent a box of candy to the junior in charge of the laboratory procedures at the Boston City Hospital. The enclosed note said "Dear Doctor: I am just recovering from the effect of your tests. I am sending this box of candy as a token of my appreciation." The medical son of an elderly physician once told me that his father used to say "The trouble with modern medicine is that it continuously takes away from rather than gives to the patient."

Obviously, sound medicine cannot be carried out without the support of the laboratory. But practice of good medicine is not possible without the dominating influence of the clinical study of the patient. In other words, one must not justify the complaint of the patient who, on changing physicians, said to Dr. J. B. Herrick "Doctor, I do hope you will be different from the other doctors whom I have consulted. I trust you will look less at the x-ray picture and more at me."

THE PSYCHIC COMPONENT

The importance of the study of the social and mental aspects of the problems presented by patients has already been emphasized to the student in the medical school. But in hospital practice this assumes even greater importance. Every disease has a psychic component. The specific problem is always the quantitative estimation of its role. The criticism that social and mental components of disease are neglected in the hospital is valid, but the judgment that these aspects of medicine cannot be adequately cultivated in hospitals is not sound. If a house officer learns to pay individual attention to the patient and to his problems and if he overcomes the tendency to become impersonal in the hospital, he will be successful in his future practice. And this truism holds also for visiting physicians and teachers regardless of whether they are on a full time or a part time basis. It is not correct to assume that just because one is a professional teacher one cannot be an excellent practicing physician. The lives of such clinicians as James MacKenzie, Wenckebach, Osler, Peabody and Thayer illustrate this point.

The harmful effect of acting in a routine manner in the hospital cannot be minimized.

Instead of being visualized as a frightened mother suffering primarily from worries caused by uncared for children left at home and only secondarily from pain of rheumatic fever, the patient becomes labeled as the case of rheumatic fever in the second bed on the left. If only the word "case" could be eliminated in hospital practice, a distinct advance would be made in the care of the patient. This tendency to handle patients in a routine way shows its most harmful effect in treatment. In the hospital, as in private practice, treatment must be individualistic. The use of a "precedent book" in treatment of patients may be justified in the early stage of the intern's career, but if every case of pneumonia is treated exactly the same, only a small portion of the therapeutic possibilities will be utilized. It is easy to become lost in the "scientific" method of treating a disease and to forget that in a given patient the specific disease is caused by a disturbance amenable to simple therapeutic procedures.

The young graduate must learn the art of communication with persons of different mental and social levels. For the first time he will learn the necessity of looking after not only the patient but also the relatives. For it is by no means always the patient alone who is sick; often the family as well is disturbed to the verge of illness.

AT THE BEDSIDE

Medical discussions at the bedside require careful consideration. Some able psychiatrists have warned of the psychic trauma of such medical talks and have advised that discussion of the patient's condition should always take place outside the sick room. But the situation, in my experience, is not so simple. The physician's contact with the patient in the hospital is too limited at best. If discussions at the bedside are conducted with discrimination and tact, they can be used as an effective therapeutic influence in reassurance. In many instances such indirect familiarization of the patient with his condition, with the reasons for the advised treatment and for the optimistic prognosis has a most beneficial result. A patient is more apt to resent too little rather than too much discussion of his condition.

The value of the patient's stay in the hospital will depend to a large extent on the instruction given to him and his family at the time of discharge. And yet after long, difficult and expensive study in the hospital, patients are frequently discharged without adequate instruction or education. This discharge instruction must be specific, intelligent and personal. It must consider the economic, social and specific family situation. Full cooperation with the social service workers and local physicians is essential. The intern in the hospital should acquire the habit of respecting and keeping in close contact with the practitioners of the community. After the patient's discharge from the hospital, a detailed summary of the results of the hospital study should be sent to his physician.

A number of important specific problems will arise toward the end of internship. The decision as to whether to take a residency and the question of the type of residency most desirable will be difficult. Here I should like to mention only one point. Young physicians entering academic medicine should acquire good training in one or more of the medical sciences. Residencies offering opportunities for clinical investigation are often a good preparation not only for so-called academic medicine but also for the practice of medicine. Clinical investigation is an effective method of learning clinical medicine, and the mental discipline acquired in research can be effectively used in private practice in the future. I have had opportunity to discuss this problem with practicing physicians who have spent a number of years as residents in research laboratories, and they all felt the benefit of such training in their work in the community.

IN THE WORLD

The change from hospital to practice or to other positions is another momentous step. Although the fundamental nature of the problems encountered will remain the same, the objectives and the emphasis will change once more in the new situation. I should like, accordingly, to dwell briefly on certain points already discussed.

Let me state at the outset that, because of insufficient experience, my competence to discuss this stage of a medical career may rightly be doubted. And yet I have known able physicians and have learned to admire in them certain qualities. My acquaintance with these men has revealed that their achievements and greatness, like those of all people who do constructive work, depend not on a single quality but on a specific combination of many qualities, not all of which are admirable. Thomas Jefferson characterized the genius of Washington as follows: "His mind was great and powerful without being of the very first order; his penetration strong though not so acute as that of Newton, Bacon or Locke; and so far as he saw, no judgment was ever sounder. It was slow in operation, being little aided by invention or imagination, but sure in conclusion. . . . He was in every sense of the words a wise, a good and a great man. His temper was naturally high toned; but reflection and resolution had obtained a firm and habitual ascendancy over it. If ever, however, it broke its bounds, he was most tremendous in wrath. . . . On the whole, his character was, in its mass, perfect,

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Diagnosis should be considered the first phase of treatment. Certain aspects of private practice simplify diagnosis; others make it more difficult. The practitioner knows his patient intimately and he sees him from time to time. He is familiar with his mental, emotional and bodily patterns. He has an opportunity to know the normal physical signs of his patient. Hence he possesses a well established normal base line. When a new symptom develops, he need not spend time with the "past history" or apply the machinery of fine search. He will not try to "cover himself" at the expense of his patient. He will not search for Koch bacilli in the sputum or take stereoscopic roentgenograms of the chest whenever slight fever and cough develop, just because cough is the earliest manifestation of pulmonary tuberculosis and of carcinoma of the lung. And yet to know when the combination of symptoms signals a disorder of minor significance and when it indicates the early manifestation of illness of a serious nature requires keen insight and mature judgment. This is the most crucial test of the physician's ability.

THE PATIENT'S WELFARE

When faced with diagnostic difficulties the practitioner is influenced by practical considerations, such as the relative frequency and the therapeutic approachability of the diseases suspected. The patient's welfare receives first consideration. He is particularly desirous of avoiding a mistake in diagnosis, which in turn would deprive the patient of therapeutic benefit. The possibility of missing the diagnosis of a case of incipient pulmonary tuberculosis, of a meningioma or of an islet tumor of the pancreas will prey on his mind more than failure to diagnose malignant nephrosclerosis or dissecting aneurysm. In his diagnostic work he takes great advantage of negative as well as of positive correlations. He knows that certain combinations of symptoms and signs rule out the possibility of certain diseases. In contrast to that of an inexperienced physician his search will be a well directed one.

Disease is usually the result not of a single factor but of a combination of factors. Overemphasis on single etiology of diseases has been the outstanding mistake of medicine during the past half century. The patient's complaint is frequently the result of the additive effect of several types of disability of independent origins. Thus circulatory collapse in a postoperative state is often the result of several chemical and physiologic factors. Severe dyspnea can be the result of the combined presence of a slight degree of anemia, rheumatic heart disease and bronchitis. Similarly, ataxia of pronounced degree may be caused by two disturbances of independent nature, such as syphilitic tabes and combined system disease of nutritional origin. A prolonged toxic psychosis following bronchopneumonia may be brought about only in part by the central effect of the infection. The preexisting personality, alcoholism and arteriosclerosis can play roles of equal importance in etiology. Hence, real diagnosis requires a painstaking analysis and keen evaluation of the relative role of all the active etiologic factors and all the bodily changes. How nearly correct one is depends on how deeply one wishes to look. To attach a medical label is not equivalent to making a good diagnosis; and correct prophesy of observations in the deadhouse is but an anatomoclinical correlation, and this is not identical with diagnosis of the patient as a psychophysical unit.

Frequently a correct diagnosis cannot be made because the disease has not advanced far enough. Diagnostic suggestions or arbitrary conclusions should not be mistaken for established diagnoses. Faced with such diagnostic difficulties it is essential to maintain painstaking search and an unbiased mind. One should continue to observe the patient day after day. Preconceived ideas and lack of thoroughness and of diagnostic zeal are the most frequent causes of misdiagnoses. As far as possible the diagnosis should always be a positive one, and not one made only by exclusion. This is particularly important in cases of psychoneurosis. Failure to find evidence of "organic disease," so called, is not sufficient to justify the diagnosis of neurosis. For such a diagnosis, as for other disease, positive and specific etiologic factors and characteristic content of the disease must be found. There are conditions, such as certain types of infection, neoplastic disease, fractures, neurosis and diseases of the liver and bile ducts, which are apt to offer particularly great diagnostic difficulties.

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patient and physician, because the physician himself is a therapeutic agent. Hence one cannot separate what is often called the art of medicine from the use of therapeutic measures. The conduct of the physician, what he says and what he does not say have frequently as much to do with treatment as the administration of drugs, if not more.

The time of therapeutic nihilism is over. As recently as 1931 an able physician advised students that, "with the tendency to recover which is inherent in every one, you need not be fussy about just what medicine you can use." But the situation has been radically changed by the discovery of effective hypnotics, analgesics, thyroxine, adrenal and pituitary hormones, insulin, liver extract, vitamins, sulfanilamide, atabrine, carbarsone, prostigmine and specific serums, to mention but a few. Even neurology and psychiatry are yielding to therapeutic approach. We are living in the beginning of an era of the greatest therapeutic triumphs in the history of medicine. This newly acquired knowledge, however, places increased responsibilities on the physician because all therapeutic agents not only can do good but also can be harmful. The practice of medicine has ceased to be but a supervision of the play of the forces of nature. It is rapidly becoming a field of biologic engineering of active intervention. In order to practice good therapeutics the physician must know the beneficial as well as the untoward effects of the physical and chemical agents. He must be as individualistic in treatment as he is in diagnosis. He must have at his disposal all the measures available for the treatment of the same ailment, so that if one fails he may try another. The supervision of the treatment must be close, and too much must not be relegated to nurses. All the patient's complaints should be taken seriously and treated. The importance of the treatment of symptoms is often underestimated. The art of providing sound sleep for a restless patient with pneumonia or with coronary thrombosis may be a lifesaving measure.

THREE IMPORTANT THINGS

The patient will base his opinion of his physician's efficiency on the clarity and specificity of the therapeutic directions. Language is an important vehicle of therapeutic remedies. In giving instructions the physician must keep the initiative. He must not allow himself to be unduly influenced by a dominating attitude on the part of the patient. It has been pointed out by many able physicians that a physician "may be a mine of information, but if he cannot or will not sit down and work out with a nervous patient a suitable diet to overcome his constipation and ducks away from headache and backache, constipation and neurosis, he will not be and cannot be a successful practicing physician." One must not project one's impatience and ignorance on the patient. In describing certain difficult surgical problems, Dr. John Homans claims facetiously that pain in the left lower quadrant is one of the most baffling symptoms known in surgery. According to him, this usually occurs in females of almost unparalleled dreariness. "If you feel that the problem is not soluble ahead of time, it is hard to keep your discipline and to remain thorough and still harder not to become a little irritated and end by taking out your irritation (and shortcomings) on the patient. You tend to forget three important things: that (1) you have held yourself out as a doctor, (2) the patient is paying for your services, and (3) even women with unaccountable pains in the lower left quadrant are also God's creatures."

Before using a placebo be sure that you know your patient. Some of them are anxious to have and are unable to live without a tonic or pill, while others consider it as an insult to their intelligence. Before advising surgical treatment, be certain that all simpler measures are ineffective. Select competent surgeons. Mortality rates depend not as much on the type of operation as on the type of surgeon. There are situations in both medicine and surgery in which application of measures accompanied by danger is justified. Before deciding on heroic measures, however, it is wise to share the responsibility of such a decision with other physicians.

The application of psychotherapy is indicated for every patient regardless of the disease. There is a mental element in every disease. Furthermore the psyche represents the summit of integration and the cortex has an intimate connection with all organs of the body. Reassurance and gaining of confidence are the starting points of psychotherapy; only after this has been accomplished should psychic treatment of a specific nature be taken up.

The problem of what to tell the patient is a much discussed one. Set rules cannot be followed. It is advisable to size up the patient and to feel one's way a little before starting an important talk. Obviously not all the implications of a disease should be discussed with the patient or, as a rule, even with relatives. The patient should be relieved of as much care as is feasible, and he must not share the worries of the physician. One of the primary functions of the physician is general leadership and guidance in situations usually considered emergencies by the patient. Make the patient actively happy and anticipate his desires and fears. What the truth is, often we physicians do not know, and

naked truth may be untruth. It is only rarely justifiable to tell a patient that he is suffering from an incurable disease. All sick human beings, and ill physicians in particular, wish to maintain hope. The knowledge of approaching death is depressing mentally and often throws the most courageous patient into periodic panic. Physicians frequently face difficult psychologic situations, and the solution of these may appear unattainable. On such occasions move slowly and time will help to solve the problem. As a disease progresses to a grave stage, remarkable psychologic changes take place in the patient. His interest rapidly narrows down and his suffering usually decreases. Very sick patients are not inquisitive, and they do not suffer. If you ask a patient on the verge of death how he is, he will reassure you that he is comfortable and at peace.

ETHICS

Ethics and the art of medicine are interdependent aspects. This is not the place to discuss medical ethics. Suffice it to state that a good physician has the same qualifications as an ideal man in his relation to his fellow men. Such a physician need not match his conduct, letter by letter, to the codes and paragraphs of the rules of ethics of medical associations. It is said that a minister once defined a gentleman as "one who has more regard for the rights of others than for his own feelings and for the feelings of others than for his own rights." This is an ideal definition of medical ethics to strive for.

From what has been said it follows that the art of medicine is not such a mysterious quality as some physicians would make us believe. The art and science of medicine cannot be separated because the human quality and aptitude on which the art depends can be effective only when trained in the science of medicine. Indeed, the time may not be far distant when the human relations active in the art of medicine will be defined scientifically.

FUTURE TRENDS IN MEDICINE

All of us in medicine are keenly interested in the future because medicine is as dynamic and vital as the human race. The dominating desire of the profession is to serve and to improve this service. Not only are new methods constantly devised, but new trends take place in professional activities from time to time. Hence all physicians must remain flexible and they must face the future fearlessly and with an open mind.

It is probable that the discovery of new diseases and the nosologic approach are gradually reaching their limits. Advance will come mainly from the better and deeper understanding of known diseases and of the already defined problems. This field belongs primarily to the clinical investigator. Thus there exists in medicine a situation not unlike that in the broader economic and social problems of the world of today. As President Compton has recently stated, "The geographical pioneer is now supplanted by the scientific pioneer, whose thrill of discovery or urge for reward are no less keen, and whose fields for exploration appear to be unlimited. Without the scientific pioneer our civilization would stand still and our spirit stagnate; with him, mankind will continue to work toward a higher destiny."

In a sense medicine, like the arts, is greatly influenced by the spirit of the times. Thus the desire for freedom in the nineteenth century yielded simultaneously the impressionist in art and the psychoanalytic school in medicine. As demanded by the "zeitgeist," new aspects are constantly added to the structure of medicine. In ancient Greece with the foundation of the Hippocratic Code medicine became organized for the first time on the basis of ethics and became separated from religious cults. Scientific medicine was added less than a century ago as an effect of the free scientific inquiry of the eighteenth century and, as a result, medicine has undergone a technologic revolution. One of the most important acquisitions of modern medicine is the responsibility for the health and social welfare of the public. The first recognition of such an obligation to society at large dates back to the end of the last century, but it is now that the practical implication of this aspect of medicine is becoming particularly pressing.

PRIVATE PRACTICE

Will this emphasis on social welfare abolish private practice? One can answer this question with a definite "no." It is probable, however, that certain departures from present day practice will be inevitable. The human desire to seek privately the attention of able physicians existed long before the development of organized society. Economic and political changes cannot abolish this deeply rooted instinct. But, as the result of revolutionary changes in the economic and cultural status and in the social organization of society, rearrangements and improvements in medicine, as in other walks of life, are essential. If these are made prudently they will open up new fields and will redistribute the functions of physicians according to their interest and ability. The economic status of physicians will improve.

"Socialized medicine" of the future will be but an accentuation of trends already existing. In a closely interwoven society of the future the supervision and aid of the normal mental and bodily development of the individual will become of increasing importance in the life of

nations. The activity of the medical profession will therefore have to come into more intimate contact with organizations devised to improve human happiness. Certain trends already in practice in pediatrics could be profitably extended to adult medicine. Such "social" practice of medicine, paradoxic as it may sound, will bring physicians closer to the individual. Thus medicine of the future will play an increasingly important role in the life of the individual as well as in the welfare of society.

The romantic reverence for the old time practitioner, rich in qualities that made him the family adviser, confidant and friend, is fully justified. I am bold enough to claim, however, that there is in the making a young medical generation which, after a difficult and somewhat bewildering period, will be equally rich in these human qualities but which, in addition, will be able to do more for the welfare of the patients than their predecessors. The young practitioner of the future will be willing to give himself, will understand the springs of human emotions and will be able to give as good care in the majority of medical diseases as the best specialists of today. This new practitioner will once more have the confidence and the respect of the community.

Comments and Reviews

MEDICAL EDUCATION OF THE FUTURE

Abstract of an article by Sir John Parsons, F.R.C.S., published in the Lancet, March 2, 1940.

At present the medical curriculum tries to cater to both general practitioners and specialists. The curriculum should be strictly designed to turn out the best type of general practitioner. Many will say that it is impossible to prune the curriculum without disastrous results. This is a fallacy which depends largely on the old fashioned idea that it is impossible to teach applied science scientifically except on an elaborate basis of pure science; yet there are thousands of physicists and engineers who can use the calculus practically without any profound knowledge of pure mathematics, and thousands of people who make good use of instruments the working of which they do not understand.

The fundamental principle which must permeate the whole curriculum is that every subject shall be taught with the ultimate aim of producing a first class general practitioner kept steadily in view. The anatomy and physiology syllabuses should therefore be drastically revised, not by anatomists and physiologists, but by surgeons, physicians and general practitioners who are conversant with the requirements of clinical medicine. It is probable that in these subjects new and carefully expurgated textbooks would be helpful. The same remarks apply to bacteriology and to a less extent to other subjects. It is, however, in the practical laboratory classes that the most time could probably be saved. This suggestion applies least to anatomy, though even there dissections need not be as minute as is customary and more use might be made of specimens specially prepared to demonstrate anatomic relations of most importance to the general practitioner. More time can be saved in the practical classes on physiology, histology and bacteriology. No general practitioner and very few consultants cut their own sections, make their own cultures or do their own Wassermann tests and there is no good reason why the student should waste his time doing what he cannot do efficiently. The same principle applies to clinical laboratory investigations. The student should be compelled in the first instance to examine patients and make tentative diagnoses without the aid of elaborate clinical, laboratory and other tests. Having done so he should learn what further specialist examinations and what special laboratory investigations are indicated for the more complete elucidation of the cases.

GENERAL PRACTITIONERS SHOULD TEACH STUDENTS

The clinical teaching of undergraduate students should be entirely in the hands of those members of the visiting staff who are in active private practice. They at least have some knowledge of how to deal with patients other than the ordinary hospital patient. Even their experience is not ideal for the purpose and it would be an excellent innovation if good general practitioners could be attached to the staff to instruct the students in the routine of general practice and the manifold vagaries of private patients. Only those who have had a few years' experience of general practice can appreciate the inestimable advantage of dealing with patients as a consultant; and only they can realize the *faux pas* which the best of consultants can make in the presence of private patients.

A DEPLORABLE MISTAKE

It was a deplorable mistake by the board of education to put the control of undergraduate teaching in the hands of whole time units. These should be confined to research work and postgraduate teaching. The unit system is

admirable in its proper sphere. It accounted more than anything else for the success of the Johns Hopkins Hospital in Baltimore some years ago but, carried to excess, as it was in that hospital, it inevitably broke down and had to be modified. In my opinion the whole time professor should be entirely a research worker and postgraduate teacher. He will therefore belong to the type of man, like the physiologist or other pure science professor, who through love of research is willing to live on a moderate income. It can only rarely be the case that such a man will devote himself to surgery or obstetrics. Hence these should be part time professors, and the only whole time ones should be those of medicine and such branches of medicine as attract the same type of man as the physiologist.

The control of medical education should be in the hands of a specially selected council. The qualifying examinations should be confined to the essential requirements of sound general practice, for which purpose it should number among its members general practitioners of wide experience. For the higher postgraduate examinations, committees should be appointed to report to and confer with the council.

THE RELATIONSHIP OF HOSPITAL TO MEDICAL SCHOOL

Condensation of an address by Dr. Alan Gregg, director of medical sciences, the Rockefeller Foundation, delivered at the seventieth anniversary of the founding of the Children's Hospital, Boston, and published in the Harvard Medical Alumni Bulletin, October 1939.

In America, despite our tendency to overorganization, there are working human relationships which are essentially simple and direct. In the relationship between hospital and medical school we might take the human arm as a model with its greater usefulness because of the joints, with one rigid part articulated with another, and motive power, like muscles, fixed in both of the separate but articulated parts. The hospital and the school are not ankylosed into a single stick; they work better apart, with freedom, individuality and independence. The two ends of a muscle are not attached to the same bone, nor is the motive power of a hospital effective if limited to the hospital alone; it must be attached to and acting on neighboring entities.

In the relationship of hospital and medical school what are the qualities which each possesses and which are of value to the other? The medical school is on the river of youth. Out of the medical school flows a river of young men who make the present more significant because of their future. You can select from the best of these young men and so a connection with the school assures you an advantage in one of the primary tasks of a hospital—the renewal and recruitment of a superior staff. Good men are what matter. Many a research institute that is devoid of teaching connections misses the advantage which is offered by contact with a medical school in the recognition and recruitment of the abler men of the oncoming generation.

Human beings try to do their best when faced with youth for whom they are setting an example. The teaching activities of a hospital thus tend more than almost any other factor to elicit the best efforts from the hospital staff. And as a reward for this extra effort a hospital with close teaching affiliations extends its influence far beyond its staff and its patients. And so we see the medical schools, which offer youth, continuously refreshing the hospital, extending the radius of its influence, holding the staff to concert pitch.

And now what is the unique quality of the hospital? Hilaire Belloc, in a book now unhappily out of print, wrote an excellent account of another human institution, the road. He traces the origin of the road in the early English path which followed its haphazard course in response to local need, avoiding rivers, forests and marshes. The trackways of earliest England were primitive, the distances short, the cost of maintenance borne locally. How many years these scant roads were in such limited use we do not know, but we know that when the Romans came they brought a totally new concept of the road. No one who has seen a Roman road will ever forget it. The Romans built roads with overwhelming insistence on their true function to provide swift, easy, direct, safe, permanent travel. The Romans ignored the effort necessary to build their magnificent roads, or at least they spread that effort over the entire province, charging it to military necessity and the cost of government and the common welfare.

By now you must have seen the analogy. The Roman road of medicine is the hospital. The hospital does for medicine what the Roman road did for travel. It does not stop with trivial, immediate and short spanned need. The hospital insists on rendering the optimum in the care of disease, the swift, easy, direct, safe, permanent, far reaching care of the sick. Like the Roman road builders, the founders of a hospital do not cavil at the cost but fix their eyes on the effectiveness of the service of the hospital as a hospital. The hospital is to the history of medicine what the Roman road was to the history of transportation, an immense step forward.

It is the unique contribution of the hospital that it permits physicians to give undivided

attention to the potentialities of medicine regardless of fees, the capacity to pay and similar distractions. In the hospital we have a Roman road so excellent that its expanding usefulness justifies its cost by vast increases in the number of those who come to use it.

I do not ignore the private practice of medicine or underrate its importance: it needs and it serves the hospital. Nor do I imply that hospitals need no repair. Even the great Roman roads fell into disrepair and neglect in the Dark Ages. But medicine has gone far and fast and straight in the hospital. It is the Roman road of medicine, bold, direct, serviceable, and by its wide utility a saving beyond the ken of those who would have killed it with parochial caution or small minded doubt.

BONDS BETWEEN HOSPITAL AND MEDICAL SCHOOL

If it is the peculiar function of the hospital to free doctors' minds of a hundred obstacles to the freest application of their skill and to focus their attention on the potentialities of medicine itself, what association could be more appropriate than close bonds with the medical school where teaching and research are going on? But the hospital has two other functions: it is there that the student learns to turn his knowledge through experience into wisdom and use his facts to acquire skill. It is in the hospital that the student learns team work and collaboration in the care of the sick. Rightly the hospital insists that the first consideration is the welfare of the patient, for so it brings together all the threads of medical science and experience. In some professions we live too much in awe of the learning acquired by mere words and symbols; the hospital corrects that overemphasis by requiring skill, experience and practical judgment.

Now let me mention some factors which favor the articulation of hospital with medical school. First is good will, a purely sentimental term unless behind it lies the loyalty and trust that come from similar ideals, purposes, motives—in short, values held in common as part of a common heritage. I suspect that we underrate the importance of similar values, tastes and manners in matters of administration. All great civilizations have grown out of and at the same time created a homogeneous culture. If education supplies no culture of this kind but merely the tools for competitive professional activity, it will be hard to obtain the ends which administration seeks to effect. Once the mutual trust and recognition of the elements of each other's integrity is secured, the most valuable collaboration between school and hospital lies in methods of nomination and selection of staff. The most effective procedure is for the school to nominate and the hospital to give final approval. It is not a method proof against failure, but its failures are remediable. No other method is so likely as this allocation of responsibility to enlist the active interest of the medical school in the research and teaching taking place in the hospital.

A factor of enduring value to the cooperation of hospital with medical school is physical proximity. You are to be congratulated on that advantage already secured, and yet special effort must be made here to make up for being separated from the rest of Harvard University, for in your plans for this hospital the criticisms, suggestions and contributions from other parts of the university should not be ignored. Sociologists, economists, anthropologists, geneticists, historians, psychologists have knowledge germane to your tasks yet likely to escape you simply by reason of their absence from the scenes of your work and your leisure. I say leisure advisedly. When the great embryologist Spemann was chosen head of the Kaiser Wilhelm Institute for Embryology he said to the president, von Harnack, "Excellency, I cannot promise great discoveries." "We quite understand that," replied von Harnack. "And furthermore," said Spemann, "I cannot promise to be industrious." "What does that mean?" asked von Harnack, "Because some of my best ideas have come to me when I was not being industrious."

PITFALLS

I have spoken of relationships between hospital and medical school. I have likened those relationships to an articulation, the elbow, in which separate bones articulate one on the other, a useful form of independence, a sacrifice of schematic unity to practical mobility. Let me in passing exorcise rheumatism, which renders joints stiff, painful and larger than they need be—the rheumatism of institutional pride, of tradition that sacrifices a real future for a falsified past, and the rheumatism of formal definitions in place of good will, of letter being thought more important than spirit; in short, on considering the part greater than the whole.

I have suggested that, if the hospital is the place where medicine can realize to the full its innate potentialities, it simply must associate with any institution where knowledge is being extended by research. The hospital cannot wisely confine its staff to routine or forego the alertness of the research atmosphere. And above all the hospital must seek out youth, the youth coming on perpetually through the university. If you will maintain, expand and cherish your relations with the medical school you will be trustees not only of your children's hospital but of the hospital for your children's children.

ACHIEVEMENT OF STUDENTS IN PRECLINICAL AND CLINICAL MEDICINE

Condensed from an article by Charles H. Brown, Rush Medical College, and Robert H. Brown, Clark University, in the Psychological Record, July 1939.

The average preclinical grades, in terms of grade points obtained by 399 students at the University of Chicago, have been correlated against the average clinical grades obtained by the students in two years of clinical medicine at Rush Medical College. We have also determined the coefficient of correlation between the average grade in clinical medicine and the grade received in each of the five main departments of preclinical medicine: anatomy, bacteriology, biochemistry, pathology and physiology.

A second problem in the achievement of students in clinical medicine at Rush Medical College involves a comparison of grades obtained by students transferring from two year and four year medical schools. Rush Medical College admits to clinical medicine a fairly large number of transfer students from schools offering only preclinical medicine. We have found that these transfer students make a worse record, in general, at Rush Medical College than students spending their entire four years at the University of Chicago or transferring from four year schools. The coefficient of correlation between preclinical and clinical averages indicates a real relationship between preclinical and clinical achievement. Apparently the factors which make an individual a good student during his first two years also operate during his last two years. The relationship between grade in a specific department of preclinical medicine and average clinical grade is greatest for pathology, least for anatomy and biochemistry.

The average grades of 1,025 students entering clinical medicine at Rush Medical College from various schools in the country were listed. Only grades obtained at Rush in the two clinical years and expressed in terms of grade points are considered here.

The poorest average grade was obtained by 127 students from school A. Many students enter and complete the first two years of medicine at A who cannot be kept for the clinical years. In this respect A is both a two year and a four year school. To complete their medical training a large number of students must transfer from A to some other school for the last two years. The inferior record of students from A may very well result from transfer of the poorer students rather than from inadequate medical training.

A tabulation clearly indicates the scholastic inferiority, in general, at Rush of students who transfer there from schools offering only the first two years of medicine. This inferiority may result from one or more of several factors. One may be lower admission standards in schools which teach only the first two years of medicine as compared with schools teaching the entire four years. Another factor may be poorer teaching facilities in the two year schools. Still another factor may be the greater transition a student must make when he transfers from a two year school to a four year school; the transition from preclinical to clinical medicine is, in general, more gradual in four year schools. Regardless of the factors involved, the results indicate the scholastic superiority in clinical medicine of students coming from four year schools as compared with students from two year schools.

SOME CRITERIA OF A GOOD TEACHER

The point of view of a student at Northwestern University Medical School.

1. The skill of separating "wheat and chaff" in dealing with voluminous literature.

2. The gift or capacity to outline and summarize clearly.

3. The ability to present material more vividly and forcefully than is possible in the more formal language of textbooks; to reinforce memory and to provoke thought.

4. Fair tests and grading. Ten years after graduation a very successful man still dislikes a course because one instructor repeatedly graded him unfairly.

5. A warm, personal interest in his students and his subject. Students quickly react to the emotional attitude of a teacher. This factor permits a teacher to project a note of encouragement, or a shadow, over the future work of his students. This is the factor which makes us work for a teacher's course and like it.

6. Good professional standing, which stimulates the student's respect for the teacher and the subject matter presented.

What Makes a Profession

If there is such a thing as a profession as a concept distinct from a vocation it must consist in the ideals which its members maintain, the dignity of character which they bring to the performance of their duties, and the austerity of the self-imposed ethical standards. To constitute a true profession there must be ethical traditions so potent as to bring into conformity members whose personal standards of conduct are at a lower level, and to have an elevating and ennobling effect on those members. A profession cannot be created by resolution or become such over night. It requires many years for its development, and they must be years of self denial, years when success by base means is scorned, years when no results bring honor except those free from the taint of unworthy methods.—W. A. SHUMAKER, Editor of Law Notes.

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section.

Ninetieth Annual Senior Banquet

The junior class of St. Louis University School of Medicine conducted the ninetieth annual senior dinner dance, April 3, at Norwood Hills Country Club in St. Louis County. Nearly 650 faculty members, alumni and their wives and students attended to pay tribute to this year's graduating class. The committee was headed by Leo J. Hofschneider, Rochester, N. Y. Patrons for the dinner included Dr. and Mrs. John Auer, Dr. and Mrs. Goronwy O. Broun, Dr. William T. Coughlin, Dr. Joseph Grindon, Dr. and Mrs. Ralph A. Kinsella, Dr. and Mrs. Alexander J. Kotkis, Dr. Fullerton W. Luedde, Dr. Alphonse McMahon, Dr. and Mrs. Leroy Sante, Rev. A. M. Schwitalla, S.J., Dr. and Mrs. Carroll Smith, Dr. and Mrs. Hyman I. Spector, Dr. and Mrs. William H. Vogt Sr. and Dr. and Mrs. John Zahorsky.

Symposiums at Columbia on Shock and Syphilis

Four senior medical students were speakers in a symposium on shock at Columbia University College of Physicians and Surgeons, New York, under the auspices of the local chapter of Alpha Omega Alpha, April 8. Their discussions of the historical background, physiology, clinical aspects and therapy were followed by discussions by Dr. Virgil H. Moon of Jefferson Medical College of Philadelphia; Dr. John Scudder of the Rockefeller Institute for Infectious Diseases, New York; Dr. Norman E. Freeman of the University of Pennsylvania, Philadelphia, and Dr. Dana W. Atchley of Columbia University College of Physicians and Surgeons.

A symposium on syphilis was held under the auspices of the college, April 12-13. The speakers at the first session were Drs. Joseph G. Hopkins, Haven Emerson, James L. Miller, Dabney Moon-Adams, Paul Gross and A. Benson Cannon. On Friday and Saturday afternoons demonstrations were held in the Vanderbilt Clinic. Saturday morning Dr. Harold N. Cole, of Western Reserve University School of Medicine, Cleveland, discussed latent syphilis; Dr. John A. Kolmer, of Temple University School of Medicine, Philadelphia, "Interpretation of Serological Tests for Syphilis"; Dr. Edwin P. Maynard Jr., Long Island College of Medicine, Brooklyn, "Cardiovascular Syphilis," and Dr. Louis Chargin, New York, treatment of early syphilis by the continuous drip method.

Mississippi Premedical Students Awarded Scholarships

Tulane University of Louisiana School of Medicine, New Orleans, has announced the award of Commonwealth Fund scholarships to premedical students from Mississippi who will join the Tulane freshman class this fall. The premedical students are James L. Booth, Longstreet C. Hamilton, of Jackson, Miss., Robert S. Ellis, Drew, Miss., and Martin B. Harthcock Jr., Clarksdale, Miss. The scholarships provide $1,000 a year for four years; the student agrees that after graduation and on completion of a two year internship he will return to Mississippi and practice medicine in a rural community for at least three years. The four students were selected by the committee of the faculty of Tulane from some forty men who had submitted applications. These scholarships are provided each year as part of a program to better rural medical service, which the Commonwealth Fund of New York City has undertaken in Mississippi with the cooperation of the Mississippi State Board of Health and the Tulane University.

Encouraging Tufts Students to Write

The Scientific Forum and the Medical History Club at Tufts College Medical School, Boston, are student organizations that give undergraduates an opportunity to present papers. Members of the Scientific Forum were guests, March 10, at the home of Dr. Benjamin Sachs, professor of ophthalmology; Mr. Edward J. Howley, '41, presented a paper on "Cataracts" and Mr. Paul J. Coughlin, '41, a paper on "Optic Neuritis." The Tufts Medical History Club met at the Metropolitan State Hospital in Waltham one Sunday recently and heard Mr. George A. Dodge, '41, read a paper on the "History of Insanity," and Mr. Jerry Saltz, '42, a paper on "History of Homeopathy in America." The superintendent of the hospital, Dr. Roy D. Halloran, invited this group of students to be his guests.——The William Harvey Society at Tufts Medical School was addressed, April 5, by Dr. Emil Novak, associate professor of obstetrics, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, whose subject was "The Endocrine Influence of Certain Ovarian Tumors."

Dr. Braasch Addresses Chicago Students

Two hundred student and graduate members of the Alpha Kappa Kappa medical fraternity attended the annual Tri-Chapter Banquet at the Chicago Athletic Club, April 4. Dr. William F. Braasch, head of the Division of Urology at the Mayo Clinic, Rochester, Minn., discussed "Future Trends in Medicine." Dr. Herman L. Kretschmer, clinical professor of genitourinary surgery, Rush Medical College, Chicago, was toastmaster. Entertainment was furnished by Maxwell F. Kepl, '39, Northwestern University School of Medicine, at the piano, and by Dr. Chester C. Lockwood and students Stearley Harrison, '40, Philip N. Hogue, '40, Perry Sullenberger, '43, and Richard Houlihan, '43, who sang. Among the graduate members present were Drs. Percival Bailey, professor of neurology and neurologic surgery at the University of Illinois College of Medicine; Robert W. Keeton, professor of medicine, University of Illinois College of Medicine; Charles E. Galloway, assistant professor of obstetrics and gynecology, Northwestern University School of Medicine, and Dr. Frank B. Kelly, associate clinical professor of medicine, Rush Medical College. Student James W. Pick, who will receive both his Ph.D. in anatomy and his M.D. in June at Northwestern, was chairman of the banquet committee.

Microscope Selected by Virchow

During his last illness, Dr. Joshua M. Van Cott, Brooklyn, gave his microscope to Dean Jean A. Curran of Long Island College of Medicine, expressing the hope that he could devise some way of continuing its many years of usefulness. This microscope is a fine instrument picked out at the direction of Dr. Rudolf Virchow during Dr. Van Cott's visit to Berlin for postgraduate work over fifty years ago.

Temple University News

At a fireside chat at the Phi Rho Sigma fraternity house on Washington's birthday, Dr. Isadore W. Ginsburg, resident in medicine, spoke on the methods of study one should pursue to get the most out of the student years; in the following week, Dr. John Lansbury, associate professor of medicine, spoke on "Medical Ethics." Dr. William Edward Chamberlain, professor of radiology and roentgenology, addressed the Phi Chi fraternity at Temple, February 23, at the annual dinner and dance, on "Medical Economics." Among the guests were Dr. Francis F. Borzell, president of the Pennsylvania State Medical Society, Dr. Rufus S. Reeves, president of the Philadelphia County Medical Society, and Dr. William N. Parkinson, dean of Temple University School of Medicine. Dr. Frank H. Lahey, of Boston, addressed the medical students, February 29, on "Management of Thyroid Diseases" on the occasion of the annual midwinter dinner of Temple University Medical School Alumni; special clinics were held in the various amphitheaters.

First McDowell Lecture at Louisville

The Ephraim McDowell Lectureship has been established at the University of Louisville School of Medicine, Louisville, Ky., by the Phi Beta Pi medical fraternity. The first lecture was given by Dr. M. Herbert Barker, Chicago, March 6, at the Louisville City Hospital, on "Modern Pioneers in Peripheral Diseases." Dr. Irvin Abell gave a résumé of the life and work of McDowell.

Convention of Premedical Students

The sixth biennial convention of the national honorary premedical fraternity Alpha Epsilon Delta was held at the University of Oklahoma, Norman, March 21-23, with representatives from twenty-eight chapters in nineteen states. The address of welcome was delivered by Prof. Aute Richards, director of the school of applied biology, University of Oklahoma, and the response by Prof. Kenneth B. Stevens of Central College, Fayette, Mo. The delegates made a tour of inspection of the University of Oklahoma School of Medicine, Oklahoma City. Among the speakers at the banquet held in Oklahoma City Saturday evening were Gen. Robert U. Patterson, formerly surgeon general of the U. S. Army and now dean of Oklahoma University School of Medicine; Dr. Wendell McL. Long, and Dr. Henry H. Turner.

All Seniors Have Internships

The *Long Islander Medical*, which is issued by the Alumni Association of the Long Island College of Medicine, Brooklyn, announces that every member of the senior class (1940) already has been appointed to an internship.

The Contin Society

The newly appointed dean of New York Medical College, Dr. Ferdinand C. Lee, was chosen by the students to receive honorary membership in the Contin Society, an honorary scholastic society of the New York Medical College and Flower-Fifth Avenue Hospitals, which held its annual dinner in New York on March 1. Among the student members elected to the honorary society were Robert C. Berman '41, Sol Commins '40, Joseph B. Cramer '41, Herbert Fanger '40, Milton Kramer '41, Anne Strax-Robbins '40, Leon Ryack '40, Louis J. Tedesco '41 and Irving Wecksell '40. The annual Contin lecture on this occasion was delivered by C. W. Coates of the New York Zoological Society, who spoke on "Aquarium Life and the Behavior of Fishes." The alumni secretary of the Contin Society is Dr. Abner I. Weisman, New York.

Johns Hopkins Students After Twenty-Five Years

The class of 1915 of Johns Hopkins University School of Medicine held a reunion at the Elkridge Club, Baltimore, February 24, for which occasion reminiscences held the spotlight. "Can you recall matriculation into the clinics—Thomas, Barker, Thayer, Futcher and Hamman? The evenings at Thayer's house; the afternoon teas at Barkers; the kindergarten sessions with 'Farmer John' Howland, but above all the chats with and the friendly advice of those we admired and revered? Do you recall the patients you were to examine and the diagnosis, the 'before and after' picture, the testimonials and the clinical evidence we had to evaluate? Who ever heard of such an examination? All but one of us made the grade, however. The celebration at our success started at Hanselman's and finished at the Rennert, where we showed Janeway and the others an evening at home that they never forgot." The booklet prepared for the reunion shows that Dr. Thomas M. Rivers, of the Rockefeller Institute for Medical Research, New York, is president of the class. There is a picture of the class at the time of graduation and a picture of each member of the class as at present, together with his accomplishments. Of the ninety that graduated, including six women, most of them spent the two years after graduation in hospitals, although one or two went directly into practice or administration work and several took teaching positions. Sixty-one served in the army during the World War, four in the navy, two in the Public Health Service—one with the State Department, two with the British army and one with the French forces. Thirteen have died: one was killed in France, two died of influenza in 1918, three of coronary disease, three of tuberculosis, one of postinfluenzal encephalitis, one in a motor accident, one killed himself and one took an overdose of ergotamine tartrate. Of the seventy-seven living, ten are professors, twelve associate or assistant professors, six are associates, two are special lecturers and eight are instructors or assistants in medical schools. One is a dean of a medical school and one is director of the Rockefeller Institute for Medical Research. The average age at graduation of the class of 1915 was 26.8 years. Sixty-six of the members have married and have living 105 children; sixteen of the married ones have no children, twelve have one child, twenty-two have two children, eleven have three children and four have four children.

Meetings of the Scientific Forum at Tufts

The Scientific Forum at Tufts College Medical School, Boston, is in its tenth year as an undergraduate scientific society. This group meets from time to time at the homes of physicians on the faculty. The November 5 meeting, at the home of Dr. Philip E. Meltzer in Brookline, was addressed by Richard Lavigne, '41, on the "Treatment of Nose and Throat Infections in Infants and Children" and by Henry J. Myers, '41, on "The Tonsil Question." The November 26 meeting, at the home of Dr. Dwight O'Hara in Waltham, was addressed by Raymond Yesner, '41, on "Ringworm of the Hands and Feet" and by Alice Lowell, '41, on "Psychogenic Factors in Gastrointestinal Upsets." The December 10 meeting, at the home of Dr. Hyman Morrison in Roxbury, was

addressed by John J. Finn, '41, on "Rheumatic Fever" and by George A. Dodge, '41, on "Recent Advances in the Treatment of Pneumonia." The president of the Scientific Forum this year is Gerald F. Hogan, '41.

New Scholarships at New York

New scholarships to aid students at Cornell University Medical College were recently established by the Trustees of Cornell University. The Jeremiah S. Ferguson Scholarship Fund of $5,000 memorializes a member of the original medical college faculty and secretary of the college since 1914, who died on June 30, 1939. The income of approximately $200 a year will be awarded annually to outstanding students in the third and fourth years in need of financial aid. An anonymous gift of $10,000 endows the Charles R. Stockard Scholarships, in memory of Dr. Stockard, who had been a member of the faculty since 1906 and who died, April 7, 1939.

Faculty Seminars at St. Louis

For nineteen years St. Louis University School of Medicine has held bimonthly faculty seminars in order to provide better interrelationship between the various departments of the school. The April 11 seminar included a paper by Dr. William H. Luedde entitled "Polaroid," with a demonstration of the planets through a 3 inch telescope, and a paper by Hugo Krueger, Ph.D., entitled "Experimental Analysis of the Action of Morphine on the Small Intestine." The seminars are preceded by a collation in the Medical School Cafeteria.

Scholarships at University of Pittsburgh

Two scholarships for women students in the University of Pittsburgh School of Medicine are offered by the Congress of Women's Clubs of Pennsylvania. Application should be made to Mrs. Henry Davis Stark, 406 Pennsylvania Avenue, Pittsburgh. Certain additional scholarships are available for students at the medical college, about which information may be obtained from Mr. J. G. Quick, registrar, University of Pittsburgh.

Student Lectures in New Orleans

Dr. Alton Ochsner, professor of surgery, Tulane University of Louisiana School of Medicine, New Orleans, addressed the interns at Charity Hospital, April 5, on "Varicose Veins."——Dr. Walter H. Judd, medical missionary from China, addressed the medical students of Tulane recently on the practice of medicine in China. ——Dr. Reuben Kahn, University of Michigan, Ann Arbor, addressed the medical students of Tulane and Louisiana State University in March on the serologic diagnosis of syphilis.——The downtown students of Tulane were addressed on shock, March 16, by Dr. Alfred Blalock, professor of surgery at Vanderbilt University School of Medicine, Nashville, Tenn.

Undergraduate Honor Society at Louisiana

Announcement is made of the formation of an undergraduate honor society in the Louisiana State University School of Medicine, New Orleans, under the sponsorship of a faculty committee consisting of Dr. Beryl I. Burns, dean, Dr. Charles Midlo, and Dr. James D. Rives. The fourth year membership is limited to the upper tenth of the senior class and the third year membership to the three highest ranking students in the junior class. The organization is known as The Circle.

The membership from the fourth year class includes Edgar P. Breaux Jr., Roy A. Chatelain, Milton Flocks, Herman J. Halperin, Elmer C. Heringman, Abe Mickal and James T. Nix Jr. The three highest ranking third year students, whose election to The Circle has just been announced, are Emanuel Dubow, Spurgeon M. Wingo and Norman C. Woody Jr. The officers of the society are James T. Nix Jr., president, Abe Mickal, vice president, and V. P. Halperin, secretary-treasurer.

Lecture to Premedical Students

Dr. Howard G. Hill, chief of obstetrics at the County Hospital, San Bernardino, Calif., recently gave an illustrated lecture entitled "Obstetrics, Its History and Development," before members of the California Beta chapter of Alpha Epsilon Delta, national honorary premedical fraternity, at the University of Redlands, Redlands, Calif.

Duke to Have Department of Psychiatry

Through a grant of $175,000 from the Rockefeller Foundation, Duke University School of Medicine, Durham, N. C., has established a department of psychiatry and mental hygiene to begin operation next September. Dr. Richard S. Lyman, lecturer in psychiatry at Johns Hopkins University School of Medicine, Baltimore, will head the new department. The Highland Hospital at Asheville, which was presented to the university recently by Dr. Robert S. Carroll, will be used for the department. Dr. Lyman graduated from Johns Hopkins in 1921, was associate in psychiatry there from 1923 to 1925, associate professor of psychiatry at the University of Rochester, N. Y., from 1925 to 1929 and spent the year 1930-1931 at the Institute of Experimental Medicine in Leningrad with Pavlov in the department of physiology. In 1931 he became associate professor of psychiatry at the National Medical School in Shanghai and from 1932 to 1937 held that position at Peiping Union Medical College. He has been at Johns Hopkins since 1938.

Juniors Appointed to Alpha Omega Alpha

Five members of the junior class of St. Louis University School of Medicine were appointed to the local chapter of Alpha Omega Alpha March 17: Clifford N. Crawford, Pasadena, Calif.; Lee George Allen, Litchfield, Ill.; Thomas J. Kelley, Los Angeles; John V. King, St. Louis, and Ralph J. Nold, Belleville, Ill. The local chapter of Alpha Omega Alpha conducts monthly student seminars and sponsors the annual William W. Root address, which this year was given by Dr. Edgar C. Ballenger, Atlanta, Ga., vice president of the American Urological Society, on "Sulfanilamide in the Treatment of Genito-Urinary Infections."

National Board Questions

At the examination of the National Board of Medical Examiners, Part I, September 11-13, 1939, the questions in bacteriology and immunology were as follows:

Answer any five questions: 1. Name four diseases which may be acquired by man from lower animals. Give the name of the pathogenic organism, name of animal, way in which human infections are acquired, and method of control of each disease. 2. Discuss the etiology of the common cold. 3. Outline the methods in use for the bacteriologic control of milk. 4. Contrast active and passive immunity. Select any disease and explain the relative merits of the two types of immunity in its control. 5. Mention the infectious material required, the method of characteristics of the organism in a smear preparation to be used in making a bacteriologic diagnosis of the following diseases: (a) pulmonary tuberculosis, (b) diphtheria, (c) gonorrhea, (d) anthrax, (e) Vincent's angina. 6. Describe briefly (a) the Neufeld "quellung" reaction, (b) agglutinin absorption, (c) variability of bacteria, (d) phenol coefficient, (e) serum sickness. 7. Name two tapeworms which infest man in the United States. How is the diagnosis of human infestation made from a specimen of feces?